

2nd INTERNATIONAL CONFERENCE ON
**ENGINEERING, SOCIAL- SCIENCES,
AND HUMANITIES** VIRTUAL CONFERENCE

IC-ESSU-22

30TH - 31ST MARCH 2022

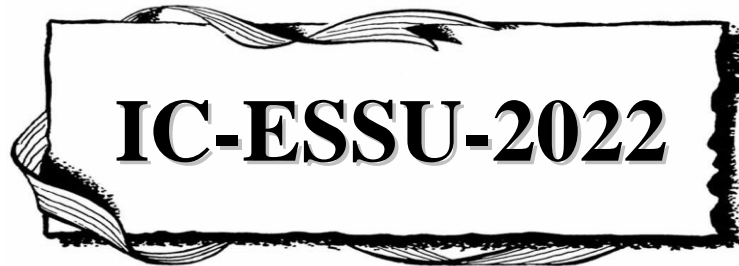
PHILIPPINES



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Institute For Engineering Research and Publication (IFERP)

ISBN : 978-93-92105-57-9



2nd International Conference on
**Engineering, Social- Sciences and
Humanities**

Foster and propagate rational expertise in the field of Engineering, Social- Sciences, and Humanities



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Institute For Engineering Research and Publication (IFERP)

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Publisher: IFERP Explore

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IFERP-Explore

Editorial

We cordially invite you to attend the **2nd International Conference on Engineering, Social-Sciences and Humanities (IC-ESSU-22)** on **30th–31st March, 2022**. The main objective of **IC-ESSU-22** is to provide a platform for researchers, students, academicians as well as industrial professionals from all over the world to present their research results and development activities in Science Technology and Management. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in there view process, and to the authors for contributing their research result to the conference.

Since January 2022, the Organizing Committees have received more than 100 manuscript papers, and the papers cover all the aspects in Science Technology and Management. Finally, after review, about 38 papers were included to the proceedings of **IC-ESSU-22**.

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **IC-ESSU-22** We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

Acknowledgement

IFERP is hosting the **2nd International Conference on Engineering, Social- Sciences and Humanities - 2022** this year in the month of March. The main objective of **Engineering, Social- Sciences and Humanities** is to grant the amazing opportunity to learn about ground breaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The session will serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and be known as a thoughtful leader.

I express my gratitude to all my colleagues, staffs, professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful.



Rudra Bhanu Satpathy

Chief Executive Officer

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**2nd International Conference on
Engineering, Social- Sciences and
Humanities**

(IC-ESSU-2022)

**Philippines
30th – 31st March, 2022**

Keynote Speakers

Welcome Message



Mostafa Ewees, PhD

Associate Professor at Organizational Behavior & Psycho-Analysis at University of Texas in Austin , Stanford University at California

Message

Honourable guests, ladies and gentlemen,

It is my great pleasure to welcome you to the **2nd International Conference on Engineering, Social Science and Humanities (IC-ESSU-22), Philippines** " on **30th-31st March 2022**, Organized By **Institute For Engineering Research and Publication (IFERP)**.

Various experiences of the governments all over the world tell us that the effective management of each person and their network is the core factor for a sustainable development of the future government.

Highlighting and sharing such an international recognition, the Conference will review and evaluate the activities of **IFERP** for the last two years and consequently search for directions and strategies for human resource utilization of the 21st century.

I certainly believe that the Conference will bear fruitful results and lay the firm groundwork for future development of public human resource management.

We look forward to seeing you online to enjoy our intervention .

Welcome Message



Mark G. Lauby

Senior Vice President and Chief Engineer,
North American Electric Reliability Corporation
(NERC), Atlanta, Georgia, USA

Message

I am delighted to be part of **2nd International Conference on Engineering, Social- Sciences, And Humanities (IC-ESSU)** organized by **Institute for Engineering Research and Publication (IFERP)**!

Realizing our vision of a net zero carbon future is dependent on a reliable, resilient, and secure bulk power system. As the electricity industry transitions in support of this ambitious target and as a consequence the economy becomes more electrified, we are witnessing and experiencing a sustained shift toward what is known as, “3-Dimension (3-D) Grid Transformation.” That is:

- **Decarbonized** – the interconnection of variable energy generation
- **Distributed** – energy resources, such as rooftop solar and other resources, connected to the distribution system
- **Digitized** – in load management and also in grid operations

While collectively the 3-Ds will deliver a grid with a lower carbon footprint, more localized control over resources, and better operational data for efficiency and optimization with variable generation like wind and solar, there is increased risk of fuel availability. Further, distributed resources—especially those residing behind the meter—mask true loads and operator visibility to them, and every digital device added to grid increases the attack surface for cybercrime.

The challenges presented by the 3-Ds coupled with the speed at which transformation is occurring, driven by public policy, technology breakthroughs, customer preferences, and economics is breathtaking. While the impacts to reliability, resilience, and security of the bulk power system are known and measurable, the electricity industry generally takes action in a deliberate, collaborative fashion. A paradigm shift is needed in terms of methods, collaboration, and coordination to expedite our response.

It will be important that this paradigm shift is undertaken in a manner that assures continued and enhanced reliability, resilience, and security that are vital to meet the needs of the society of the future. There is little doubt that our dependence on electricity as the engine of our economy will increase in the future, as the grid transforms to its clean energy future.

I welcome you all to the **2nd International Conference on Engineering, Social- Sciences, And Humanities (IC-ESSU)**! It will be a great place to meet others, develop collaborations, and work together towards our future!

Warmest Regards,

A handwritten signature in black ink, appearing to read 'M. G. Lauby', with a stylized flourish at the end.

Mr. Mark G. Lauby

Welcome Message



Prof. (Dr.) Sunil Kumar Khatri

Director of Campus,
Amity University Tashkent, Uzbekistan at Amity Education Group
Toshkent, Uzbekistan

MESSAGE

Riding on the success of its past conference over several unique themes and critical acclaim, I am immensely ecstatic to know that **Institute For Engineering Research and Publication (IFERP)** is organizing an **2nd International Conference on Engineering, Social Science and Humanities (IC-ESSU-22)** on **30th-31st March 2022** at **Philippines**.

I believe that **IC-ESSU-22** will provide a unique platform to researchers, academicians, industry experts, young professionals and scholars to widen their knowledge domain, explore and exchange new ideas, provide different insights and deliberate on various significant topics of today's competitive world developments, research challenges and unsolved open problems in the field of **Engineering, Social Science and Humanities**.

Conference is also hoping to bringing together the renowned experts from the core field and other allied areas to forge **linkages and bonds** for mutual research benefits.

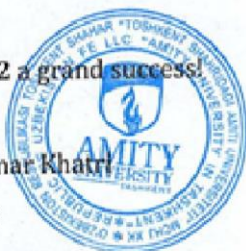
I congratulate Organising team for their remarkable efforts for organising such Conference during this pandemic time in online mode. It is only through such dedication and perseverance that one can achieve excellence.

I take this excellent opportunity to express my heartiest greetings and best wishes to the organizers and also to delegates, speakers and researchers from all over the world and wish them a great learning experience.

Wishing **IC-ESSU-22** a grand success!


Prof. (Dr.) Sunil Kumar Khatri

Director of Campus



IC-ESSU - 2022

2nd International Conference on Engineering, Social- Sciences and Humanities

Philippines | 30th- 31st March, 2022

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IC-ESSU - 2022

**2nd International Conference on
Engineering, Social- Sciences and
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Philippines

30th – 31st March, 2022

PAPERS

IC-ESSU - 2022

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The Process of the Formation of Space by Political Prisoners in Exission on Buru Island, Maluku (Period 1969-1972) (Waeapo District, Buru Regency, Maluku Province)

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Abstract

In urban development, there are often problems, namely land conversion in terms of changes in land use. The political prisoners were initially forced to open agricultural land with improvised tools which in the end grew rice fields in Maluku, the planting of rice fields managed to produce a harvest of 80 tons and until now has become the second largest rice barn. This study aims to determine the spatial changes that occur due to the disposal of political prisoners as well as the factors that influence the changes in space in Waerebo District, Buru Regency, Maluku Province. The variables analyzed are land use changes, both built and non-built areas by looking at the types of changes and the extent of changes in the area using the ArcGIS 10.5 application, then the types and extents of existing land use changes will be described descriptively. The spatial changes that occurred on Buru Island during the period of exile to the left experienced several parts, namely the Use Phase (Usage Place), Inrehab Phase (Rehabilitation Installation), Political Prisoners Release Phase and the Transmigration Phase until now which made Buru Island, especially the area that used to be a dumping site for Political Prisoners has the largest rice barn potential on a national scale. The evolution of agriculture is still being developed in supporting programs made by the government, among others, the Transmigration program. These programs are developing to date.

Keywords

changes, political prisoners, planting, factors, program

I. INTRODUCTION

Regional changes are the impact of social movements that form new spaces naturally as a result of the interaction of human activities. Urban development can be seen in population growth that develops into a community [1]. The development of a region is determined by the hierarchical level [2].

Land is limited and cannot be added except by reclamation activities [3]. The problem that often occurs in urban development is land conversion in terms of land use changes [4]. The increasing need for land causes a process of land use change, especially the conversion of vegetated land into built-up land [5]. Reference [6] which states that land conversion is generally irreversible or irreversible. Vegetated land which has mainly been converted into built-up land is very difficult to convert back into vegetated land.

Indonesia experienced National Political turmoil, one of which was the September 30th movement (G30S) of the Indonesian Communist Party/PKI or G30S PKI for short. The G30S PKI incident changed the national political constellation [7]. One of the impacts of this incident was exile in remote parts of the country. On August 17, 1969, 800

people were sent to Waeapo District, Buru Regency, Maluku to form settlements. The total number that was sent was 10,652 people. The process of leaving for Buru Island forced political prisoners to build the existing infrastructure on Buru Island [8].

Maluku is an archipelagic area, the natural conditions are hot, arid, and transportation accessibility is not adequate. Land tenure is a sensitive matter for the Maluku people in general [9]. Some of the land on the island of Hunt is covered by forest, but many forests are damaged so that they are overgrown with shrubs [10]. This study aims to identify the process of spatial change that occurred in the period 1969 to 1972 that occurred in Waeapo District, Buru Regency, Maluku Province and the factors that influenced these changes.

II. METHODS & MATERIALS

A. The Process of Forming Space

Human activities require space as a forum for interaction Hakim [11]. Human resources and natural resources are the main supporting parts of utilization in shaping spatial planning [12]. According reference [13], public spaces have great access to the surrounding environment. Spatial planning is a vision of a future form of spatial configuration that describes a systematic form of physical, social, and

economic aspects to support and direct space to increase productivity [6].

There are 4 components of room development, including: 1) Individual human (Anthropos) and local area (Community) in a large urban community, 2) Living room (Scallops), 3) Organization, 4) Nature [14]. There are two styles that influence each other in urban land use change and formation, namely the sripetal style, the situational style, and the social development style [15]. According reference [16], the spatial structure of the physical aspect such as the function of the building, the shape of the building, land use, and so on has changed quite rapidly except for the road pattern.

B. Land use classification

Land use change is the transition of an old land use form and location into a new one [17] or a change in the function of a land at different times [18]. Reference [19] studied land use change that can change from one form to another in 6-8 year intervals. Changes in land use with urban development are certainly unavoidable, starting from deforestation which is replaced by settlements and so on [20].

Reference [21] mentions that suburban areas are urban fairies. Peri urbah area is defined as an area that experiences a physical mixing of urban and rural areas²¹. Patterns of land use change include longitudinal patterns and scattered patterns [22]. Non-agricultural land use is basically a non-agricultural land use including urban land use, industrial area land use, road network systems, recreation and conservation areas or nature reserves [23]. Reference [24] states that the better and more complex a road infrastructure will result in the formation of activity centers and functions.

C. Initial Conditions of Buru Island

The G30S PKI incident in Indonesia resulted in the sending of political prisoners to Buru Island as political prisoners from 1969 to 1977, totaling 14,000 political prisoners [25]. Buru Island is the second largest island in Maluku Province after Seram Island. Buru Island is divided into two administrative areas, namely Buru Regency and South Buru Regency [26]. Buru Island is known by the name Bupolo/Dampolot which means full of swamps and pecek [27].

The Buru people are people who live on the coast until the Dutch concentrated the Buru people to Kayeli (the center of Dutch government in the colonial era) so that the settlement pattern of the Buru people became centralized [26]. Waeapo Subdistrict is a pure location built by Political Prisoners at the end of 1969. At the beginning of the Dutch occupation of Buru Island, the main commodities on Buru Island were forest products in the form of cloves, nutmeg, charcoal and eucalyptus, besides that there was also wood oil. white from the distillation of eucalyptus tree leaves [28].

Reference [29] in the traces of the Dutch colonialism on Buru Island in the 17-18 century AD revealed that the process of massive spatial change occurred when the VOC occupied

Buru Island in search of spices and then concentrated all community activities.

D. Methods

This study uses a qualitative descriptive method and uses overlay analysis by overlapping the map results from the field survey. The qualitative descriptive research method was chosen because of the nature of the research that tends to be qualitative in nature, namely research in the form of pictures and narratives. According reference [30] qualitative research is research that uses open interviews to examine and understand the attitudes, views, feelings and behavior of individuals or groups of people. This research is descriptive in nature which focuses on historical tracing in the form of spatial developments formed by political resistance and also a track record of relics during the exile.

In the process of data collection carried out in order to connect researchers with the research location. Data collection was carried out, including the preparation stage and field survey, namely directly observing the research object located in Waerebo District, Buru Regency, Maluku Province. Secondary and primary data collection methods are carried out so that the data that has been obtained can then be managed for research needs.

The overlay method is carried out in order to describe the existing condition of the research location from year to year which is then presented in a partial change map tabulation so that it is easy to interpret as research needs.

III. RESULTS

Buru Island as a location for exile is a stretch of wilderness and has a stretch of sago and eucalyptus trees that grow wild and there is the largest river on Buru Island, the Waeapo River which is the only source of life for the local indigenous people. Several political prisoners were sent from various regions as part of the social sanctions which were the impact of the G30S PKI incident and the National Political constellation.

The spatial changes that occurred on Buru Island during the period of exile to the left experienced several parts, namely the Use Phase (Usage Place), Inrehab Phase (Rehabilitation Installation), Political Prisoners Release Phase and Transmigration Phase. During the 10 years he was in the location of political prisoners, he built around 500 ha of rice fields and plantations which are used to this day.

Based on Solihin (2020), an informant who became a political prisoner, a political prisoner who was exiled on the island of Buru to continue the Tefaat (utilization) and Inrehab (Manage) development program for all physical buildings in the Unit area on average all the same, such as places of worship. (mosque, church, temple), monitoring post, commander's house, dam, art building, irrigation, and rice fields.

The Transmigration Program held by the government should occupy all existing units, but only some units are occupied

because some units do not have a proper agricultural system, so some units must be abandoned. This research is included in the administrative section of Waeapo District which has approximately 7 villages including Savana Jaya Village which includes (Unit VIII and Unit XIV), Gogorea Village, Waetele Village (Unit XV), Waenetat Village (Unit XVI), Air Mendidih Village, Village Waekasar and Command Headquarters include (Unit I and Unit II).



Figure 1. Waeapo District

Savana Jaya is a central unit for Political Prisoners in developing the area, both the village government system and the style and procedures for land management managed by the government. Savana Jaya is a unit with a very striking change in space since the sending of families of prisoners who turned barracks into settlements.

The sending of political prisoners to Buru district was carried out in stages and divided into several groups. The first group was assigned to clear the land, while food was still provided by the government at that time. Political prisoners are forced to take advantage of the natural environment to manage in order to survive. At the beginning, political prisoners carried out the process of clearing rice fields and fields but they could not be harvested so that the prisoners were forced to eat anything edible, such as wild animals.

The second group was sent from Nusa Kembangan in 1972. The second group was tasked with developing areas where political prisoners were exiled and forced to develop rice fields, including building irrigation, dams and making plans for settlements after sending the families of political prisoners.

In December 1972-May 1973, the New Order government sent families of political prisoners. The sending of families of political prisoners aims to change the conditions of the barracks into villages. Political prisoners build public facilities such as schools and hospitals. Teachers and doctors are filled by the political prisoners themselves. Political prisoners also develop agricultural areas including rice fields, plantations, dams, drainage and irrigation of rice fields.

After the island's political prisoners were released, the transmigration program was released. In 1979, the transmigrants were sent to Buru Island to occupy land that had been cleared by political prisoners and immediately

divided into each unit for a total of 22 units. In this study, located in Waeapo District, there are six. The total land use established by political prisoners on the island of Buru is as follows:

Table 1. Area of land use for political prisoners.

Number	Unit Name	Unit area (Meters)	Rice field area (hectares)
1	Unit I Wanapura	610	1000
2	Unit II Wanareja	440	500
3	Unit IV Savana Jaya	680	500
4	Unit XIV Pilareja	440	50
5	Unit XV Waetele	440	500
6	Unit XVI Waenetat	440	500
	Total number		6100

Source: field survey on 2020

IV. Discussion

This research aims to identify the existing conditions formed by political prisoners, as well as to see the process of spatial changes that occurred during the period of exile in the period 1969-1979 and what factors influenced the changes in space. This study uses a qualitative descriptive analysis method to take a deeper look at the existing processes in the field and a Spatial Overlay analysis to see changes in land use in the period 2005 to 2019.

A. Analysis of the Process of Changes in Land Use Political Prisoners

Waeapo Subdistrict, Buru Regency, is a former location for exile for Political Prisoners. The units resulting from the formation of Political Prisoners are included in the administrative section of Waeapo District, including Savana Jaya Village which includes (Unit VIII and Unit XIV), Gogorea Village, Waetele Village (Unit XV), Waenetat Village (Unit XVI), Air Mendidih Village, Waekasar Village, Waekerta Village (Command Headquarters includes and Unit I), Waereja Village (Unit II).

Table 2. Area of Administration by Village in Waeapo District

Village	Area (km ²)	Percentage
Savana Jaya	4,58	11,15
Gogorea	2,48	6,04
Waekerta	2,72	6,63
Waetele	4,85	11,81
Waekasar	15,5	38,46
Waenetat	6,3	15,34
Wanareja	4,35	10,59
Total	41,08	100

Source: field survey on 2020

Political prisoners on Buru Island were recorded as arriving at the Utilization Place (Tefaaf) starting from 1979 to 1977, forming a place of exile on Buru Island, totaling 22 units, namely Units I-XVII and there were also units A, Unit R, Unit S and Unit T which were devoted to elderly political prisoners.

In the analysis of spatial change in this study, the focus is on land use boundaries formed by political prisoners only, which then with population growth, land use changes spread to Savana Jaya Village (Unit VIII and Unit XIV) Waetel Village (Unit XV), Waenetat Village (Unit XVI), Command Headquarters (Unit I and Unit II).

B. Analysis of the Process of Changes in Land Use Political Prisoners

Changes in land use are inseparable from human needs. The increase in population is one of the factors that influence the change of vegetated lands into built-up lands [31]. The population growth in Waeapo Subdistrict is recorded as follows:

Table 3. Population Growth in Waeapo District

Number	Year	Total Population
1	2005	28.576
2	2010	31.137
3	2015	11.836
4	2019	12.185

Source: Badan Pusat Statistik (2020)

With the change in the administrative area of the Waeapo sub-district in 2014, starting from 1 sub-district then divided into three sub-districts resulted in a spike in population growth decline in 2011 with the number of 31,137 decreasing to 11,836. The impact of the administrative split will certainly result in the dominant land use in the Waeapo sub-district.

In the Waeapo sub-district there are types of land use, namely built-up land covering areas for health, offices, education, trade and service worship, and settlements. Undeveloped land includes forest areas, vacant land, plantations, rice fields, shrubs and rivers. Productive areas such as rice fields are the dominant development areas in Waeapo District. It is calculated that the land use in Waeapo sub-district is 42.862,64 hectares. Based on the results of spatial digitization analysis using the Gis application from Google Eart images in 2015, data on land use in Waeapo District in 2005 the undeveloped area was dominated by shrubs with an area of 4,514.84ha, and settlement areas with an area of 271.75ha.

Table 4. Land Use in 2005

Number	Use of Land	Total (hectares)
1	Forest	3.247,09
2	Health	3,11
3	vacant land	268,19
4	office	5,90
5	Education	15,63
6	Worship	2,30
7	Trade and services	18,50
8	Plantation	96,85
9	Settlement	271,75
10	Persil	97,49
11	Ricefield	1.910,47
12	Shrubs	4.514,84
13	River	263,54
		10.715,66

Source: Analysis Results on 2020

Waeapo District in 2005 had a non-built productive area which was dominated by rice fields with a land use area of 1,910.47ha. Meanwhile, the bush area is an area that dominates Waeapo District in 2005 with an area of 4,403.91 ha. Based on the results of spatial analysis using the Gis application from Google Eart images in 2010, it shows that land use data in Waeapo sub-district in 2010 which includes undeveloped areas is dominated by shrubs with an area of 4,305.73 Ha, and built areas with an area of up to 338,72Ha.

Table 5. Land Use in 2010

Number	Use of Land	Total (hectares)
1	Forest	3.246,09
2	Health	10,67
3	vacant land	227,78
4	office	6,34
5	Education	12,67
6	Worship	2,30
7	Trade and services	22,67
8	Plantation	95,30
9	Settlement	338,72
10	Persil	148,60
11	Ricefield	2.035,25
12	Shrubs	4.305,73
13	River	263,54
		10.715,66

Source: Analysis Results on 2020

Waeapo District in 2010 had a non-built productive area which was dominated by rice fields with a land use area of 2,035.25 Ha. Based on the results of spatial digitization analysis using the Gis application from Google Eart images in 2015, data on land use in Waeapo District in 2015 the undeveloped area was dominated by bush areas covering an area of 3,970.15 Ha, while the built area in Waeapo District in 2015 is a residential area with an area of 451.53 Ha.

Table 6. Land Use in 2015

Number	Use of Land	Total (hectares)
1	Forest	3,245,10
2	Health	16,47
3	vacant land	152,53
4	office	11,94
5	Education	13,13
6	Worship	9,40
7	Trade and services	32,49
8	Plantation	107,13
9	Settlement	451,53
10	Persil	159,34
11	Ricefield	2,282,91
12	Shrubs	3,970,15
13	River	263,54
		10.715,66

Source: Analysis Results on 2020

Waeapo District in 2015 had a non-built productive area which was dominated by rice fields with a land use area of 2,282.91Ha.

Table7. Land Use in 2019

Number	Use of Land	Total (hectares)
1	Hutan	2868.79
2	Kesehatan	17.7
3	Lahan kosong	53.02
4	Perkantoran	13.02
5	Pendidikan	17.72
6	Peribadatan	13.4
7	Perdagangan dan jasa	43.76
8	Perkebunan	133.84
9	Permukiman	479.85
10	Persil	192.84
11	Sawah	3912.09
12	Semak belukar	2706.09
13	Sungai	263.54
		10.715,66

Source: Analysis Results on 2020

Based on the results of spatial digitization analysis using the Gis application from Google Eart imagery in 2019, land use data in Waeapo District in 2019 was dominated by bush areas with an area of 2,656.20 Ha, while the built area in Waeapo District in 2019 In 2019, the settlement area reached 479.85ha.

Waeapo District in 2019 has a non-built productive area which is dominated by rice fields with a land use area of 3,712.51 Ha.

C.Dominant Land Use Change 2005-2019

Land use in Waeapo District, Buru Regency, Maluku Province, is dominated by rice fields. Based on the 2020 BPS, Buru Regency has a harvested area of 13,110 hectares consisting of 5,328 hectares in Waeapo sub-district [32]. Until 2019, Buru Island was used as a national rice granary area.

Existing land uses in the Waeapo sub-district include forest areas, vacant land, plantations, scrub bushes and rice fields, as well as rivers covering non-built areas, while built-up areas include areas for health, offices, education, worship, trade and services, and settlements. with an average land use change reaching 829.33ha in the last five years, namely 2005-2010.

Based on the results of calculations carried out, changes in land use in Waeapo District in 2005-2010 were dominated by rice fields with an area of 283.00ha as non-built community production areas, while the built-up area was dominated by residential land with an increase in land use of 112, 00ha.

Changes in land use in Waeapo District in 2010-2015 were dominated by bush areas with an area of 352.00 ha, meanwhile the rice fields experienced an increase of 19.10 ha as a non-built community production area, the built area was dominated by residential land with an increasing number of land use of 10.30ha. The average land use change in 2010-2015 reached 624.89ha.

The changes in land use in 2015-2019 reached 38,926.32 ha. The areas in the Waeapo sub-district in 2015-2019 include forest areas, vacant land, plantations, scrub bushes and rice fields, as well as rivers, including non-built areas. Meanwhile, the built areas include areas for health, offices, education, worship, trade and services, as well as settlements.

Changes in land use in Waeapo District in 2015-2019 were dominated by shrubs with an area of 1,264.06 Ha. The rice field area has increased to 1,629.18 Ha as a non-built community production area, the built area is dominated by residential land with an increase in land use of 28.32 Ha. The average land use change in 2015-2019 reached 3,478.42 Ha.

D.Analysis of Dominant Land Use Change in Waeapo District

Changes in land use, both built and non-built areas by looking at the types of changes and the extent of changes in the area using the ArcGIS 10.5 application, then the type and extent of changes in existing land use will be described descriptively, presenting changes in land use in the period 2005-2019 in present with a table of dominant land use.

The spatial changes that occurred in Waeapo Sub-district underwent several phases of change, including being exiled

by the new order government which was then known as the Phase.

1. The political prisoner phase is the initial land clearing phase when land use is still dominated by several local indigenous villages. Political prisoners who were sent were forced to make major changes to convert forest land into residential land. The factor that influences the change in space is the primary human need for survival. Then the change in space occurred according to the needs of the political prisoners at that time to survive.

2. Transmigration Phase

Transmigrants in 1980 were part of the continuing rehabilitation program by the New Order government at that time. Land clearing by political prisoners has been completed and forms the location of the Unit complete with an irrigation system as well as a dam.

The factor that influences the change in space is the existence of a central government program in dealing with the rapid population growth in big cities, so there needs to be an even distribution in the form of sending families in the development program, namely Transmigrants.

The largest land uses in a row include dry land agriculture, residential rice fields, fishponds, trade and government services, education, ports and terminals. Meanwhile, the most dominant land use change is residential land. This is in accordance with the research of reference [33] which states that the decrease in open land occurs due to the intensive use of open land to be used as residential areas.

The existence of population growth, increased activity and infrastructure from 1999-2004 has not shown a significant change in the spatial structure because the development of the city is only in the city center and has not grown new urban developments.

According reference [34], changes in increasing population growth have an impact on activity. According reference [35], the increase in built-up land such as settlements and infrastructure is one of the factors that lead to the development of these areas³⁵.

V. Conclusions

The evolution in agriculture is the largest that has ever happened to people with the status of political prisoners, until now the island of Buru is the second largest rice supplier area on a national scale. Changes in space from groves to rice fields and the location of the location of settlements or so-called Unit locations since the beginning of the arrival in 1969, the peak occurred in 1972 when families of political prisoners were sent. This is a very striking change, especially in the Savana Jaya Unit. It was recorded that 3.50 people were exiled in Waeapo Sub-district and opened an area of 6,100 hectares complete with supporting facilities and rice fields. Changes and patterns of spatial formation carried out by political prisoners are very feasible to be developed

because they have a serious potential to affect the economy of the surrounding community.

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"TELOLET OM", The Concept of Flood Control Policy based on Community Participation

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Abstract

The concept of Flood Control in RW 05 Purwantoro, Blimbing sub-district neighborhood in Malang City are using flood control model called "Telolet Om". This action was based on community participation, which meant mobilizing the community to actively participate in the rain runoff control effort. The "Telolet Om" is a prototype made for implementing public policy which is not only focused on overcoming flood problems but also provides advantages and benefits to the surrounding community in the form of job opportunities, and provides additional economic values. The implementation of this flood management policy Regulation No. 5 of 2016 involves all layers of society and in terms of importance, this concept is not only able to maintain the sustainability of drainage maintenance but also it is expected that with this concept flooding isn't likely to occur again, it would increase green open space for community social space and increase the economic income of the community from eggplant, chilies, catfish and tomato. The methods used are observation and interviews. In-depth interviews were conducted to determine the community's willingness to live in the floodplain, losses due to flooding that occurred during the last 10 years, and community values utilized in their flood mitigation systems.

Keywords

policy implementation, flood control policy, community participation, telolet om, malang

I. INTRODUCTION

During the rainy season, several cities in Indonesia experience inundation and even flooding [1]. Throughout 2020, there were 2,939 disasters recorded and 1,070 floods [2]. Floods are disasters caused by natural phenomena during the rainy season which include regional potential, especially rivers that are relatively sloping. Floods can cause great damage to the socio-economic life of the community [3]. Malang is listed as an area that frequently occurs flood disasters with a moderate risk class in Indonesia every year [2]. The city of Malang is a city located in the highlands with varying land surface slopes, in every rainy season there are areas that experience the danger of flooding caused by overflowing rivers and poor drainage systems [4]. The proportion of open land is getting narrower causing the existing drainage system is not to adequate [5].

To deal with the constant flooding that occurs yearly in Malang city, Malang city government, through the Department of Public Works and Housing (DPUPRPKP) created a development policy based on Local Regulation No. 5 of 2016 [6]. One of several DPUPRPKP office efforts to deal with the danger of flooding in Purwantoro Urban Village, Malang City is the construction of drainage with an artificial pond system and infiltration wells [7]. Infiltration wells are water absorption methods aimed at overcoming flooding by increasing the water absorption capacity of the soil [8]. Following Malang City Regulation No. 5 of 2016 concerning Spatial Planning and Zoning Regulations for the Urban Area of Northeast Malang for 2016 – 2036 [6] has

been attempting and implementing various flood control policies since 2017, including making and repairing drains and drainage systems, increasing the area of green open space (RTH) meant for water absorption, as well as non-physical / non-technical efforts, among others, environmental awareness campaigns through banners, billboards, and mass media.

This research aims to determine the flood control policy implementation in Purwantoro Urban Village Malang City through the construction of drainage systems and artificial pond infiltration wells, supporting factors and inhibiting factors in the implementation of said policy. Implementation of community participation-based flood control policies are based on Local Regulation no. 5 of 2016 [6] in the form of a clear division of main duties and functions between implementers, and clear commitment for timely completion. Implementation is carried out by implementers who have the capacity and active participation of all stakeholders. It is expected that this policy will be capable of creating a flood-free environment that would be impactful upon the physical, social and economic aspects of the community. Public policy implementation is a series of activities after a policy is formulated and determined [9]. Implementation is the spearhead of public policy [10].

The "Telolet Om" flood control policy model is a prototype made for implementing public policy based on community participation which is not only focused on overcoming flood problems but also provides advantages and benefits to the surrounding community in the form of job opportunities, and

provides additional economic values in the form of eggplant, chili, catfish and tomatoes. The flood control policy model "Telolet Om" is a community participation-based flood control policy with a new approach in the form of a synergy of 4 (four) stakeholders; namely government, academia, business and local communities. This concept needs to be tested in its implementation in the field.

Concerning community participation in supervising the development, Reference [11] states that "without supervision and control, what is planned and implemented can go in a direction contrary to the goals outlined". This shows that community supervision in development is necessary so that in addition to what is done following the established plan, it is also to ensure that the results of development, both physical and non-physical, can meet community needs.

Reference [12] states that the participation of community members is the involvement of community members in development. Also, Reference [13] concluded that there are three important elements of participation, namely 1) mental participation means and emotional involvement, 2) motivates persons to contribute to the situation, and 3) encourages people to accept responsibility in the activity. The variables that influence the efforts made to provide optimal results as policy implementation are the content of the policy and the implementation environment [14]. implementation of policy implementation and support from stakeholders, it is hoped that the public's response to DPUPR services will be more positive and public trust tends to increase.

II. "Telolet Om" Concept and it's Implementations

A. "Telolet Om" Concept to Tackle Flooding Issues

Flood is a condition in which water cannot be accommodated in the drainage channel (riverbed) or water flow in the drainage channel is obstructed, so that it ends up overflowing the surrounding area (flood plain) [15]. Flooding can occur due to rising water levels caused by above-normal rainfall, changes in temperature, collapsed embankments / dams, rapid snowmelt, or obstruction of water flow elsewhere [16]. Flood divided in two occasions; flooding/ inundation that occurs in areas where there is usually none and second, flooding that occur due to flooding river runoffs caused by the flood discharge turning out greater than the existing river drainage capacity [17]. Most of it is caused by extraordinary rainfall so that the channel system is no longer able to accommodate the volume of water [18].

Integrated flood management is a solid process of flood management through land and water resource management approach, coastal areas, and disaster area management surrounding watershed with the aim of maximizing the benefits of floodplain areas and minimizing loss of life and property damage from flooding[Green]. Integrated flood management is an integral measure that directs all stakeholders from sub-sector flood management to cross-sectors [19].

Integrated flood management requires a conceptual framework, because [19]:

- All parties recognized the flooding problems are relatively complex. The flood prone area could be considered part of the development of both urban and rural areas, and can also be part of the regional administrative (central, provincial, district / city).
- There is a relationship between the Regional Spatial Plan (RTRW) and the Water Resources Management Pattern (PSDA), the PSDA Plan and flood management.
- There are technical boundaries (hydrology), watersheds (DAS) and groundwater basins (CAT) areas and non-groundwater basins areas (Non-CAT) which in certain conditions might be similar or different from the watershed.
- Technical (hydrological) limits can be the same or different from administrative limits.
- 'Water' is referring to all bodies of water that is found above or below the ground surface, included in this definition: surface water, ground water, rainwater, and sea water located on land.

The flood control policy model "Telolet Om (Terong, Lombok, Lele dan Tomat)" is presented as an innovative flood control model while maintaining the conservation of drainage/irrigation canals in order to provide social benefits to the surrounding community. Thus the results of this model doesn't merely provide considerable outcomes but also opens up job opportunities for the surrounding community, while also generating additional economic value in form of bountiful eggplant, chili, catfish and tomato harvests that can be felt by the surrounding community. With these benefits, the involvement and active participation of the community in the "Telolet Om" flood control policy will hopefully be maintained in a sustainable manner. Community needs to be involved in problem identification and program planning processes [20]. Community empowerment is a series of systematic actions involving various components of formal and non-formal organizations. The government only acts as a facilitator and regulator [21].

Government as central (agent of chance) of a society and implementation of good governance not only rely on the government, but organized society [22]. development will only ongoing and successful in solving problems faced by society when get full support from the community concerned because society is the central focus and ultimate goal of development [23].

The flood control policy model "Telolet Om" is a community participation-based flood control program with a new approach in the form of a synergy of 4 (four) stakeholders, namely government, academics, businessmen and local communities. The program is implemented through 6 sets of activities, namely socialization, planning, development, training and technology handover, program implementation and integrated quality assurance (monitoring, evaluation, and continuous improvement). This program provides tangible benefits to communities around riverbanks and canals in the form of inundation height reductions and an increase in overall environmental quality, as well as additional bountiful benefits that consists of catfish, eggplant, chilies and tomato harvests. The operator / technician in charge would be

arranged and appointed by the local neighborhood association known to the urban village personnel.

Flood control is carried out in stages, from flooding prevention, handling during floods (response / intervention), and recovery after flood (recovery). This stage is in a continuous cycle of flood control policies. Flood prevention activities follow a life cycle, starting from the flood, then reviewing it as an input to anticipate next flooding occurrence. Prevention is carried out comprehensively, in the form of physical activities such as the construction of flood control in river areas (in-stream) to floodplain areas (off-stream), and non-physical activities such as land use management to flood disaster early warning systems.

B. Methodology

This research is classified as qualitative research, also referred to as a naturalistic approach due to the situation in the research field is untampered or natural, not at all influenced nor made up, and as it is. For this reason, reference [24] explain that qualitative research involves a naturalistic interpretive approach to the world, trying to interpret phenomenon from the point of view of the meanings given by society. Meanwhile, reference [25] emphasizes the research process that flows from philosophical assumptions, to the interpretation of an interpretive lens, then to the procedures involved in studying social or human issues. Data analysis has started since formulating and explaining the problem, before going into the field, and continues until the writing of research results [26].

In the data collection process, the methods commonly used are observation and interviews [27]. Interviews are one of the methods of collecting data in research, especially qualitative research [28]. A good interviewer must have good communication skills. These skills include listening skills, paraphrasing, probing, and summarizing interview results [29]. Observation is a technique that is carried out by observing ongoing activities [30]. other sources say that observation is a method used by researchers to obtain information related to what will be studied [31]. The interview is a form of a list of questions that will be asked by the researcher to the informant in order to obtain information [31].

In-depth interviews were conducted to determine the community's willingness to live in the floodplain, losses due to flooding that occurred during the last 10 years, and community values utilized in their flood mitigation systems. Field observations were carried out to understand the existing community flood mitigation system, interactions between local communities with local government and related agencies, as well as the creativity, innovation and potential of local communities in developing cost effectiveness. Through observations and interviews, researchers collected narrative data in form of various accounts provided by informants and conditions in the field. In the data collection process, the researcher will interpret the accounts obtained during data collection. This approach is used to obtain in depth objective results in regard to the focus of the research. The sheer focus of the researched problem in this case were only the handling

flood hazards in Purwantoro Village, Blimbing Sub-district, Malang City. In this case the researchers made more contact and interactions with the Telolet community groups (terong, lombok, lele, tomat), volunteers, neighborhoods, and community leaders. flood control policies are divided into short, medium and long term [32].

The research is focused on the implementation of flood management policies based and supporting factors and inhibiting factors to measure the successful implementation of flood control policies based. Communication is a liaison between the community and policy makers so that existing problems will be able to produce a good implementation [33]. The implementation of flood management policies based on community participation in RW 05 Purwantoro Urban Village, Blimbing Sub-district, Malang City based on Malang City Regulation No. 5 of 2016 which includes (a) The interests and strategies of the those involved, (b) Characteristics of colleges and authorities, (c) Compliance and responsiveness. Supporting factors and inhibiting factors to measure the successful implementation of flood control policies based on community participation in existing flood management, namely: Supporting factors (Content: Content of policies; Context: Distribution of main duties and functions; Commitment: DPUPRPKP and implementers; Capacity: Implemented implementers who had the capacity).

III. DISCUSSION

C. Glintung Gg. I RW 05 Purwantoro Urban Village as Research Location

The research focus was carried out in the neighborhood of Jl. S. Parman (Glintung) Gg. I RW 05 Purwantoro Urban Village, Malang city. The decision to pick this particular location for this research was based on various considerations of researchers related to the specific characteristics of the Glintung area (Jl. S. Parman) Gg. IV RW 23, which succeeded in fixing its previously flood-prone areas to become relatively flood resistant, and is now known as "Kampung Glintung". Now this village is better known as "Biopori Tourism Village" which is the location of one of the tourist destinations, especially for tourists who are relatively passionate about environmental conservation. But on the other hand, the success of the Glintung area (Jl. S. Parman) Gg. IV RW 23 in overcoming flood problems impacted the Glintung area (Jl. S. Parman) Gg. I RW 05, that ended up flooding in its stead.

Community-Based Flood Management Policy "Telolet Om" in RW 05 Purwantoro Village, Blimbing District, Malang City is adopted from the concept of integrated flood management which has been developing globally, especially in Europe and Australia since the last decade. The involvement and active participation of all involved is a major factor in the success of the program. The Public Works and Spatial Planning Office of Malang City take their role as the coordinator of socialization and development. Academics as coordinator of planning, training, and quality assurance. Entrepreneurs contribute to the development and implementation activities. The community as program implementers is equipped with adequate knowledge and

skills so that they can implement technology according to the SOP (standard of procedure).

To deal with these flooding issues in Malang City, the Government of Malang passed Malang City Regulation No. 5 of 2016, which is diagrammatically depicted in Figure 3. "Telolet Om" is an elaboration of the Local Regulation, and its implementation will be tested in this study. Furthermore, in the implementation, the emergence of the innovative Flood Control Model "Telolet Om (Terong, Lombok, Lele, and Tomat; Eggplant, Chili, Catfish, and Tomatoes)" is not only focused on overcoming the problem of flooding/inundation but can also provide many benefits to the social community in RW 05 Purwanto Village, Blimbing District, Malang city.

The application of creative innovation for the flood control model "Telolet Om", apart from providing benefits to the surrounding residents, the sustainability of the irrigation canals, both the quality of water for irrigation and the quality of the ecosystem in it (moss and fish, in particular, are thriving), thus producing innovative mineral water content that will get better, which in turn will have an impact on the productivity of agricultural products. Meanwhile, the types of vegetables such as eggplant, chilies, and tomatoes were applied to the "Telolet Om" flood control model. Creative innovations were designed according to types of vegetables in which variety has high economic value, such as Sulawesi Eggplant, gendot/ curly chilies, and cherry tomatoes. To encourage the government and the community to continue to participate in flood control programs, it is necessary to provide an understanding that these programs can provide economic benefits through systematic prediction and assessment of costs, benefits and social values, especially to the community [34].



Figure 2 Inundation conditions in residents' houses RW 05 Purwanto Village

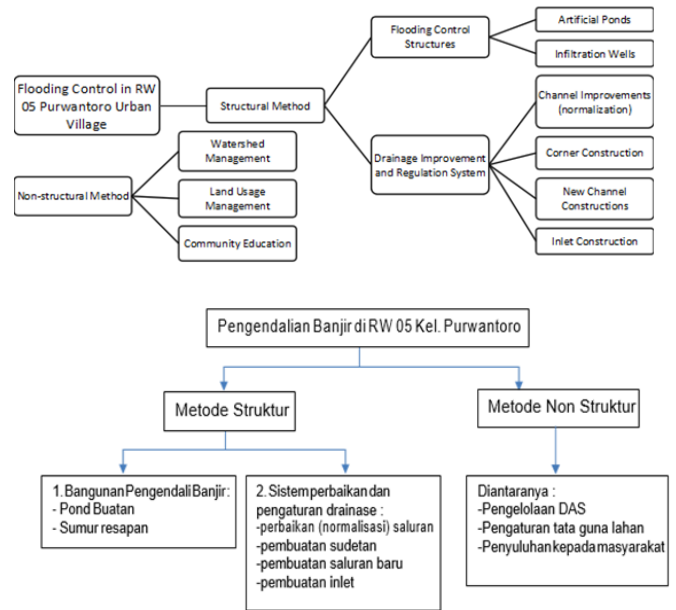


Figure 3. Structural & non-structural method of flood control
 Source: Malang City Regulation No. 5 of 2016

D. Analysis

In its implementation, the stages of the Existing Flood Control Strategy that have been carried out can be seen in Figure 4. The findings of this study are:

(1) The implementation of flood management policies based on community participation in RW 05 Purwanto Village, Blimbing Sub-district, Malang City based on Malang City Regulation No. 5 of 2016 involves all layers of society and in terms of importance, this concept is not only able to maintain the sustainability of drainage maintenance; it is expected that with this concept flooding isn't likely to occur again; it would increase green open space for community social space and increase the economic income of the community from eggplant, chilies, catfish and tomato.

(2) Institutions and authorities consisting of DPUPRKP, Unmer, local communities and local government collaborate to create a filtered drainage system and construct a pond. The community's compliance and responsiveness is remarkably good; it is proven that the community is able to work together to build and that Unmer Institution is involved in financing its development, as well as being funded by the government.

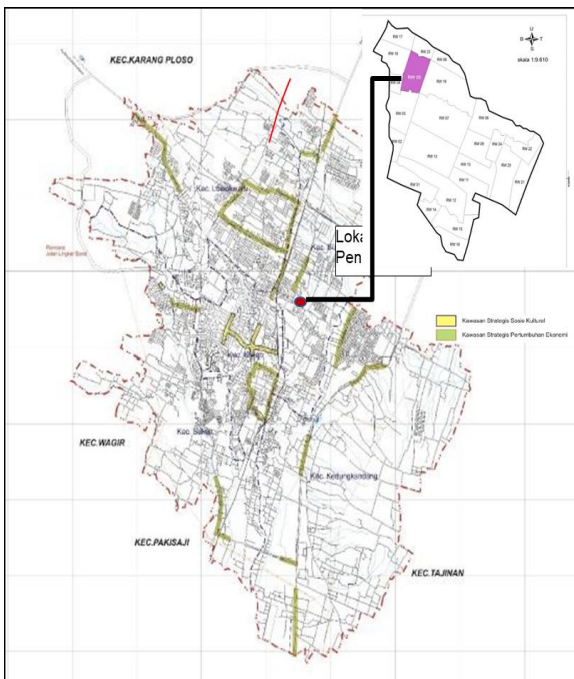


Figure 1 Glintang Gg I

Supporting factors and inhibiting factors to measure the successful implementation of flood control policies based on community participation in existing flood mitigation is listed as such:

a) Supporting factors in terms obtained content are policy support in the form of Local Regulations for flood prevention at the research location, DPUPRKP's commitment to tackling floods in form of financing which is included in the APBD budget. From contextual aspect: Well-distributed main duties and functions, and each stakeholder tries to keep to each their commitments for the unhindered realization of "Telolet Om" concept. Commitments obtained from DPUPRKP and colleges, the community and local government to actualize the "Telolet Om" concept. Assessment from capacity aspect, the implementation of activities is carried out by the implementer who has the capacity, where in its development it's technically assisted by the DPUPRKP.

b) Implementation of drainage maintenance activities incidental to water resources DPUPR in RW 05, Village of Purwantoro was written in APBD budget 2017. Flood control policy by applying the method of "Telolet Om" and producing homemade Pond to accommodate water and storm water runoff before heading up river in the environment of RW 05 Purwantoro Village has a very good physical environmental impact. Drainage with innovative technology Filtration and pond provide open green space and a productive vegetable crops (Eggplant, chili, catfish and tomatoes) to increase revenue for the community. The community empowerment approach is one form of alternative development that requires the community to be able to be independent in meeting their needs [35].

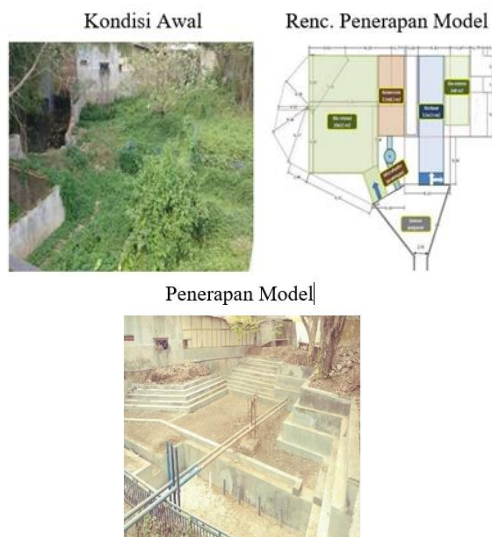


Figure 4 Original Conditions and Drainage Filter Model Implementation Plan

The community carries out and maintains the "Telolet Om" policy with full responsibility so that the program continues. Whenever there is a problem, it is immediately communicated to the Public Works Office to find a solution. Academics carry out monitoring, evaluation, and continuous improvement to ensure the quality of the program until ideal

conditions are achieved. The businessmen provide physical repair assistance to buildings or infrastructure that have been damaged by flooding. The Public Works office facilitates all participants' needs so that the program continues to run properly.

IV. CONCLUSIONS

The research conclusions are as follows:

1. Community participation-based flood control policy based on Local Regulation no. 5 of 2016 applied in the flood control policy model "Telolet Om" is a model for implementing public policies based on community participation that is focused on overcoming the problem of flooding / inundation and providing socio-economical benefits for the surrounding community. Hopefully with these benefits this policy would be sustainable.
2. The "Telolet Om" flood control policy model based on community participation with the synergy of 4 (four) stakeholders, namely government, academia, businessmen and local communities. The program is implemented through 6 sets of activities, namely socialization, planning, development, training and technology handover, program implementation and integrated quality assurance (monitoring, evaluation, and continuous improvement). The person from the community assigned as the operator / technician has been arranged and appointed by the local hamlet apparatus known to the urban village personnels.
3. Innovation of the flood control policy model "Telolet Om (Terong, Lombok, Lele and Tomat)" is included in the concept of eco-drainage, namely the sustainable handling of urban drainage systems, paying attention to conditions and environmental supportive capacity to retain as much ground water as possible and maintained ecosystem.
4. The variations of innovative technologies used in the "Telolet Om" flood control policy model are as follows:
 - a) Filterization
 - b) Artificial Pond
 - c) Infiltration wells
 - d) Injection Well
5. The implementation of the "Telolet Om" flood control model provides real benefits to the community around rivers and canals in the form of improving additional economic and or food benefits in the form of catfish, eggplant, chili, and tomato harvests so that people become enthusiastic in implementing the policy.

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A peek at the Food Delivery Application Adoption Reluctance among Generation Y in Malaysia

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Abstract

This study explores the underlying reasons for reluctance towards the food delivery application (FDA) services among Generation Y. Both technological and non-technological aspects in the context of online food delivery (OFD) services were researched. Judgmental sampling was employed to gather responses from Generation Y in Malaysia who had prior experience using FDA in the last three months. Out of the 240 responses gathered through Google Form survey, 35 were screened out. Result reveals a significant impact of social influence on the key determinants (i.e. feature of mobile apps and perceived risks) of adoption reluctance. However, these two key determinants had insignificant and significant relationships with adoption reluctance respectively. Additionally, experience has a weak moderation effect between adoption reluctance and its key determinants. This study provides a quick glimpse of Generation Y individuals' FDA adoption reluctance, especially during the COVID-19 pandemic. It explains 28.7 per cent of the respondents' adoption reluctance which implies that there could be other constructs leading to their adoption reluctance. Finally, it extends the final version of the Technology Acceptance Model (TAM) by contributing additional empirical evidence on the crucial role of non-technological aspects, especially social influence, in affecting electronic consumer behaviour.

I. INTRODUCTION

Malaysia is a food paradise due to the influence of multicultural cuisines; food industry constitutes major national income. In 2018, the industry had a relatively higher annual growth rate of 7.6 per cent with a market value of RM109 billion (Food & Beverages Industry Report, 2021). Though the Covid-19 pandemic has affected the industry with the restrictions imposed on the business operation, the industry players had quickly switched to an electronic platform to sustain their operation (Food & Beverages Industry Report, 2021). Although e-commerce in the food business has been there for years, the Covid-19 outbreak has accelerated the utilisation of electronic commerce (e-commerce) by all industry players, from lavish restaurants and fast-food chains to street food vendors (Shameen, 2021).

Pizza Hut was the global pioneer in launching the online food order transaction in 1994. The drastic growth in the online food ordering market has been subsequently championed by the smartphone penetration and sharing economy (Zakon, 2018). The online food ordering market typically comprises foods prepared by restaurants and independent people besides the groceries ordered online. The current study focuses specifically on Online Food Delivery (OFD), consisting of the delivery services for the prepared meals and food ordered online for direct consumption. Statista Market Forecast (2019) ascertained two common delivery service solutions available worldwide: Restaurant-to-Consumer Delivery and Platform-to-Consumer Delivery. While the Restaurant-to-Consumer Delivery (e.g., McDonald's) option involves the meal delivery directly by the restaurants, the

Platform-to-Consumer Delivery (e.g., GrabFood) option involves the meal delivery by the platform partners from partnering restaurants to the customers. Upon receiving the orders, food delivery apps process and send the orders directly to their partner/s. The order is completed when the delivery driver picks up the ordered items from the partner/s and send them to the customer/s (Shameen, 2021). The key idea of this business model is to deliver the foods ordered online to the house at the convenience of customer/s.

The market study of restaurant delivery services revealed an optimistic figure of the global OFD market (Statista Market Forecast, 2019). The market's revenue is expected to show an annual growth rate of 10.01 per cent for 2021 – 2025, with 2897.1 million users by 2021. Additionally, the Platform-to-Consumer Delivery solution is expected to lead the market with a whopping sales volume of US\$172,944 million by 2025. However, though the OFD segment is experiencing a sudden growth resulting from the covid-19 outbreak in the year 2020, the app's operators have reported a meagre profit of 90 US cents for every online order of US\$36, which implies about a 2.5 per cent gross margin (Shameen, 2021). Such poor margin can be explained by the cost incurred in delivering services and organizing various promotional activities to overcome the customers' reluctance to use the apps.

To date, some customers are still reluctant to order food online, especially those unfamiliar with technology, avoid trying out new things, and feel uncertain about the various aspects of OFD services (Ghosh, 2020; Kaur et al., 2020). Anic et al. (2019) explained that online privacy concerns (OPC) significantly affect the users' attitudes towards online

purchases, which can be seen from their unwillingness to provide their details to the food delivery apps. Furthermore, the higher charges imposed through the food prices and delivery fees are one of the major concerns raised by the users in using the OFD apps (Song *et al.*, 2017). BBC News (2021) reported that the total cost of ordering food online through apps is at least 23 per cent higher than buying directly from restaurants. The same article cautioned the readers on the inconvenience resulting if the OFD transaction goes wrong. The users will be given only credit refunds instead of the money-back option. Collectively, various factors lead to the reluctance in using the OFD apps. For instance, less than 20 per cent of North American households use the OFD services regularly, even during the Covid-19 crisis (Shameen, 2021). It is worth noting that they prefer to cook at home rather than buying meals online. The same sentiment was shared by two-thirds of Malaysians who participated in the survey conducted by Rakuten Insights). The participants claimed they preferred not to use OFD apps, and the usage became less during the Covid-19 outbreak as they wanted to cook for their loved ones (Muller, 2021).

Given the popularity and mixed responses towards OFD services, many studies investigated consumer behaviour in buying food online. Nevertheless, these existing studies are overly emphasizing the positive agenda of the OFD services, especially on its adoption, usage intention and acceptance (Sharma *et al.* 2021) as well as related to technology-related aspects of OFD services (Kaur *et al.*, 2021). Kaur *et al.* (2020) highlighted a gap within the existing studies that sideline the negative agenda of OFD services where the roots of reluctance towards or the non-adoption of OFD services are less explored. The current study intends to fill the gap by exploring the underlying reasons for reluctance towards the OFD services among Generation Y in Malaysia.

While Technology Acceptance Model (TAM) is primarily used to guide the theoretical stance of this study, the two key non-technological aspects, namely the social influence and users' past experiences, are also investigated. Conrscescu & Adam (2013) discovered that the opinion of others and the users' past experiences are the frequently investigated psychological factors resulting in the innovation resistance within numerous existing studies. The latest study conducted in Brazil on resistance towards digital banking services had augmented the role of psychological factors in positively contributing towards the resistance (dos Santos & Ponchio, 2021). The current study intends to consider both technological and non-technological aspects to provide a comprehensive understanding of consumer behaviour in the context of OFD services.

The current study focuses on Generation Y individuals, who are also fondly known as Millennials. The notion of Kotler and Armstrong is adopted in the current study, where those born between 1977 and 1999 are accepted as respondents. The notion of Kotler and Armstrong is held valid and appropriate in the context of the Malaysian population (Ting *et al.*, 2018; San *et al.*, 2015). IndexMundi, the online data portal, reported that the Malaysian population is dominated by

individuals aged between 25 to 54 years old in 2020 with a 40.86 per cent share (IndexMundi Home, n.d.). Therefore, this study posits that the study's target population, Generation Y, currently 22 to 44 years old, represents a significant segment of this dominant age group. Typically, these individuals are seen as the "priority audience" of OFD services compared to others (Abd Rashid *et al.*, 2016). They were found to be most willing to spend on food, including OFD orders, besides believing the efficiency of the OFD apps (Abd Rashid *et al.*, 2016).

II. LITERATURE REVIEW

Technology Acceptance Model (TAM) points out that perceived usefulness and ease of use represented the beliefs leading to IT acceptance (Davis, 1989). Perceived Usefulness (PU) refers to the extent to which users believe that using a particular system would improve his or her job performance. Perceived Ease of Use (PEOU) is defined as the extent to which a user believes that using a particular system would be effortless. Both PU and PEOU are affected by external constructs. In the final version of TAM, the attitude construct was removed because it did not fully mediate the effect of perceived usefulness towards behavioural intention (Davis & Venkatesh, 1996).

Sun and Zhang (2006) criticized that TAM has limitations in its explanatory power and inconsistencies between studies, thus calling for more research on moderating factors. They revealed that experience moderates its influences on behavioural intention (BI) and (i) PU, and (ii) PEOU. Experience refers to the extent of knowledge and familiarity about the technology of interest (Sun & Zhang, 2006). In line with this, Castiblanco Jimenez *et al.* (2021) describe experience as an individual's past interaction or exposure to a system and the accumulated knowledge gained by usage. Usage is more overwhelming for experienced than for inexperienced users. Meanwhile, it is worth noting that scholars are increasingly keen to comprehend the relationships existing between external constructs and PU and PEOU in extending TAM (Castiblanco Jimenez *et al.*, 2021). Sun and Zhang (2006) reported that social influence is the least studied construct among external constructs for TAM. Nevertheless, it is considered as an imperative factor in different models such as the theory of reasoned action (TRA), theory of planned behaviour (TPB), and Model of PC Utilization.

Based on the limitations of TAM and discussion above, this study provides a comprehensive picture by incorporating Experience and Social Influence in addition to Perceived Risks and Features of Mobile Apps in examining the users' Adoption Reluctance towards the OFD services. Briefly, as depicted in Figure 1, this study deems the Social Influence affects the key determinants of Adoption Reluctance: Features of Mobile Apps and Perceived Risks. Additionally, Experience is seen to moderate the relationship between Adoption Reluctance and the key determinants.

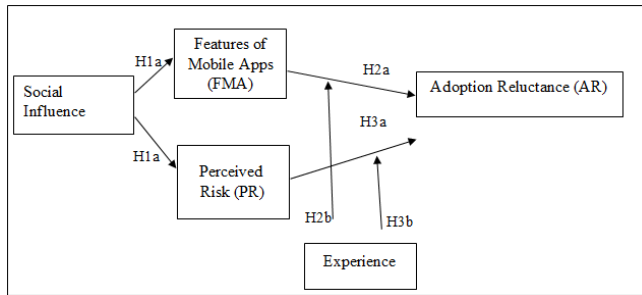


Figure 1: Proposed Research Conceptual Framework
Social Influence

Social influence is the degree to which the ideas coming from others may foster or impede technology adoption (Castiblanco Jimenez *et al.*, 2021). It refers to buyer perception of web shopping by a referent group of people who share similar needs and preferences. Apart from that, consumers can be influenced by influencers in the online review sites, social network sites, websites or app reviews (Yeo *et al.*, 2021). Social influence is reported as the most influential determinant of PU (Venkatesh and Davis, 2000). Castiblanco Jimenez *et al.* (2021) added that an individual might adopt a technology based on others’ assertion on the convenience of using the technology rather than his or her own emotions and beliefs. In other words, generation Y tend to perceive as more valuable, based on the views and recommendations of individuals closest to them. Furthermore, the ratings and reviews of users are one of the essential triggers for apps discoverability, purchase, download and install through app stores (Khalid *et al.*, 2015).

Social influence may affect the perceived risk of consumers towards food delivery service. Consumers cannot check the food product when shopping online. Therefore, consumers tend to depend on online comments to obtain sufficient information and reduce their perceived risk level (Liu and Park, 2015). Online consumer reviews infer product quality and alleviate product uncertainty, helping consumers develop confidence in the final purchase decision (Hu *et al.*, 2008). Venkatesh *et al.* (2012) pointed out that paid or fake reviews are imperative risks perceived by the users that hinder them from adopting food delivery apps. Therefore, the following hypotheses are postulated:

H1a: Social influence has a positive effect on features of mobile apps.

H2a: Social influence has a negative effect on perceived risk.

Features of Mobile Apps

Stoyanov *et al.* (2015) defined mobile apps as software designed for small, hand-held portable devices, such as tablets and smartphones. Additionally, Cho *et al.* (2019) insisted that quality attributes of mobile apps should be entirely based upon user evaluation. Scholars revealed that mobile app quality features would be essential to drive installations and boost adoption. Supporting this, Cho *et al.* (2019) highlighted the importance of developing an essential set of mobile app quality attributes representing various food choices, reasonable pricing, and convenient and trustworthy

design. Price affects the adoption reluctance of food delivery apps. Concerns often arose about food taste, price, and value for the money to be spent. A broad price spectrum directly affects the mobile app businesses where Generation Y will be less willing to indulge in higher-priced dinners. Additionally, misleading and outdated information about food vendor menu items, prices, and minimum order fees can confuse the end-user. Kaur *et al.* (2020) supported that the complicated interface, confusing contents, delay in processing and others cause consumers reluctant to use the apps.

Complexity of food delivery apps poses challenges for end-users with limited knowledge and experience using the applications. Supporting this, Sun and Zhang (2006) argued that users would employ knowledge gained from prior experience with similar technologies to form their intentions. On the contrary, users with limited cognitive capacity and experience of existing technology are more likely to be frustrated when dealing with an unfamiliar system and resisting its adoption. It is supported by Schnellbacher *et al.* (2015), who asserted that non-users refrained from the use of OFD services generally due to the perceived lack of skills required for using the online platform. In line with the above discussion, the following hypotheses are postulated.

H2a: Features of mobile apps have a negative effect on the adoption reluctance towards food delivery apps among Generation Y in Malaysia.

H2b: Experience moderates the relationship between features of mobile apps and adoption reluctance towards food delivery apps among Generation Y in Malaysia.

Perceived Risks

Baucer (1960) advocated the concept of perceived risk, which is defined as uncertainty and consequences associated with the actions of consumers. The author believes that consumers’ purchase decision is affected by perceived risk. Stone and Gronhaug (1993) point out that perceived risk consists of numerous types of risk, including functional, physical, financial, social, psychological, and time risk. Table 1.0 summarises these conceptualised definitions of different types of perceived risk. Generally speaking, the perceived risk is the degree to which a user feels the uncertainty and adverse consequences of adopting food delivery apps.

Table I Definition of Risks

Types	Definition
Functional risk	It is the risk that the product will not perform as expected.
Physical risk	It is the risk to an individual’s safety, physical health, and well-being that the product may pose.
Financial risk	It is the risk that the product will not be worth the financial price and would have been available cheaper elsewhere.
Social risk	It is the risk that a poor product

	choice may result in social embarrassment.
Psychological risk	It is the risk that a poor product choice may bruise the consumer's ego.
Time risk	It is the risk that a purchase will take too long or waste too much time.

Source: Schiffman and Wisenblit (2019); Lu *et al.* (2005)

By referring to Gupta and Duggal (2021), adoption resistance by the consumers involves perceived risks. The overall perceived risk may involve perceived functional risks such as misleading information, wrong food delivery and order accuracy; social risks such as ethical reasons, generic services, fake reviews and ratings; personal risks such as lack of personal touch and unaffordability of smartphones; financial risks such as fear of online frauds and convenience charges; psychological risks such as reliability issues and improper food delivery (Gupta and Duggal, 2021; Gupta *et al.*, 2018). Mazzini *et al.* (2016) found that perceived risk can adversely influence Malaysian Generation Y in performing e-purchase. Previous studies reported that perceived risk significantly impacts consumers' adoption of food delivery apps (Gupta and Duggal, 2021; Kaur *et al.*, 2020; Gupta *et al.*, 2018). The resistance of any innovation becomes higher if it involves high uncertainty (Kaur *et al.*, 2020). Consumers' risk perception is developed considering food not prepared following the food safety and hygienic practices, which may result in health issues (Gupta *et al.*, 2018). In addition, the delivery service is exposed to risks such as traffic congestions, road construction, and bad weather, leading to delayed delivery and freshness of food issues (Kedah *et al.*, 2015). Additionally, Kimes (2011) revealed that technology anxiety and desire for interaction are perceived risks that preventing consumers from ordering food online. Thus, they are reluctant to adopt food delivery apps. They are worried that they might be getting tangled up in the technology.

Pires *et al.* (2004) reported that risks perceived by consumers towards internet purchasing might alter with experience. Differences in perceived risk between inexperienced and experienced consumers are due to the repetition or familiarity with the process of purchasing. Perceived risk is related to the customers' delivery experiences, such as hassle in explaining the intended address to the delivery person and the delivery person's unprofessional and inappropriate conduct (Kaur *et al.*, 2020). Previous studies reported that customers' perceived risks would weaken the product usage, whereas prior online experience would increase the product usage (Gupta and Duggal, 2021). Customers will visit the same website for food ordering when they have positive prior experience (Kedah *et al.*, 2015). Kimes (2011) reported that inexperienced online ordering customers have a higher need for interaction than experienced online ordering users and resist adopting such technologies. Based on the above discussion, the following hypotheses are elicited.

H3a: Perceived risk positively affects the adoption reluctance towards food delivery apps among Generation Y in Malaysia.

H3b: Experience moderates the relationship between perceived risk and adoption reluctance towards food delivery apps among Generation Y in Malaysia.

III. METHODS AND RESULTS

This study pursues a quantitative research approach with a descriptive research design. Quantitative research approach enables the researchers to generalize the results to a broader context by gathering responses from a large enough sample. VanVoorhis & Morgan (2007) recommend fifty data sets for each causal construct in testing the statistical relationship. As illustrated in the study's research conceptual framework, there are four causal constructs in this study. Hence, the study's sample size is determined as 200 elements. Upon pre-testing the questionnaire's content, a pilot study involving 20 respondents was carried. All constructs shown good Cronbach Alpha values from the pilot test and hence all items were used in data collection. Data were collected by using Google Form posted on various social media networks. Judgmental sampling technique was adopted in this study. Only respondents within the specified age range (i.e., 22 to 44 years old) and who had experience using the OFD services in recent years were considered. From 240 responses gathered, 35 were screened out as the respondents did not meet the study's screening criteria. The retained data were analysed using the path analysis technique through IBM AMOS software.

Respondents Demographic Characteristics and General Information

From the 240 responses obtained, 205 respondents have experience in using food delivery services. The other 35 responses are either incomplete or do not use food delivery service; therefore, they are excluded from data analysis. Responses from females and males are pretty equalled; out of the 205 respondents, 57.6 per cent are female, and 42.4 per cent are male. Most of the respondents are 22 to 27 years old (69.3 per cent). The remaining respondents are 28 to 33 years old (5.9 per cent), 34 to 39 years old (4.9 per cent), 40 to 44 years old (20 per cent). This study comprises 65.4 per cent of the respondents with undergraduate qualifications, followed by 15.6 per cent of them with a postgraduate qualification, 10.2 per cent of them with a school education and 8.8 per cent of them with a pre-tertiary qualification.

Occupation of the respondents is wide-ranged – nine types of occupations. 57.6 per cent of respondents are with a monthly income lower than RM2500, followed by respondents with a monthly income of RM2501 to RM4849 (18.0 per cent), RM4,850 to RM7,099 (7.8 per cent), RM7,100 to RM10,959 (7.3 per cent) and above RM 10,960 (9.3 per cent). It is also worth noting that 53.2 per cent of respondents have used the OFD services before the imposition of movement control order (MCO). Meanwhile, 62 per cent of the respondents indicated that they had used both types (platform-to-consumer and restaurant-to-consumer) of food delivery services. The remaining respondents had used either one of the OFD services only. Only a meagre group of

respondents (i.e. 4.9 per cent) had used only the restaurant-to-consumer food delivery service.

Scale Measurement – Reliability and Validity Test

Cronbach’s Alpha was used to measure the reliability of data. A minimum value of .70 was employed to assess the internal consistency of the construct (Hair *et al.*, 2010). The Cronbach’s Alpha coefficients for all constructs are greater than .70. The coefficient alpha estimates for each of the five constructs are: acceptance reluctance ($\alpha = .930$), social influence ($\alpha = .862$), perceived risk ($\alpha = .786$), features of mobile apps ($\alpha = .806$) and experience ($\alpha = .857$). Based on the suggested cut off points, all measures appeared to be good indicators of each construct with multiple items. The mean score and standard deviation did not show any spurious data. The reliability tests, including Cronbach’s Alpha, mean and standard deviation (S.D.), are presented in Table 2.0.

Table II: Mean, standard deviation and Cronbach’s Alpha Value of Constructs

Research construct Alpha	Mean	S.D.	Cronbach’s Alpha
Adoption Reluctance	2.235	0.821	0.930
Social Influence	3.380	0.866	0.862
Perceived Risk	2.737	0.598	0.786
Features of Mobile Apps	3.748	0.554	0.806
Experience	3.689	0.663	0.857

Inferential analysis

A Path Model as shown in Figure 2.0 depicted the result of this study. Five latent constructs (Adoption Reluctance, Social Influence, Features of Mobile Apps, Perceived Risk and Experience) were included in the testing of the path model.

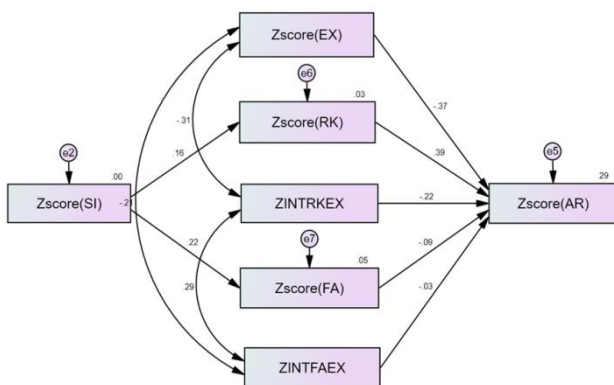


Figure 2.0 Adoption Reluctance of Food Delivery Apps Model

Table 3.0 shows the result of the model. The multiple square correlations (R square) of the model is 0.287; it implies that the study’s model can explain 28.7 per cent effect of exogenous constructs and moderators on the endogenous construct.

Table III: Squared Multiple Correlations

Construct	Estimate
ZAR	.287

Hypothesis Testing

The path relationships between the five latent constructs (Adoption Reluctance, Social Influence, Features of Mobile Apps, Perceived Risk and Experience) were assessed. As shown in Table (4.0), five hypothesised paths were supported, and two were not.

Table IV: Path analysis of Adoption Reluctance of Food Delivery Apps Model

		Estimate
FA	<--- SI	.220
PR	<--- SI	.158
AR	<--- FA	-.082
AR	<--- INTFAEX	-.014
AR	<--- PR	.369
AR	<--- INTPREX	-.135
AR	<--- EX	-.349

***. Significantly different from zero at the .000 level (two-tailed).

Note: AR - adoption reluctance, EX - experience, FA - features of apps, PR - perceived risk, SI - social influence, INTRKEX – interaction between perceived risk and experience, INTFAEX - interaction between features of apps and experience.

Following are the discussions of results based on table 4.0.

Hypothesis 1a posited that social influence has a positive effect on features of mobile apps; this hypothesis is supported with $\alpha = 0.001$ and $\beta=0.220$. This result is supported by Venkatesh and Davis (2000). They coined that social influence is the most influential determinant of PU, which determined the usage of Mobile Apps features among generation Y. Castiblanco Jimenez *et al.* (2021) proposed the same view where the perception of social groups on the usage convenient affects the perception of emotion and belief, thus influencing the adoption of technology. It was found that the opinion of other users posted as reviews and ratings have made apps more discoverable, influencing downloading, purchasing, and using those apps (Khalid *et al.*, 2015).

Hypotheses 1b posited that social influence has a negative effect on perceived risk; this hypothesis is supported with $\alpha = 0.022$ and $\beta=0.158$. As found by Liu and Park (2015), one of the downfalls of online purchase is that consumers would not be able to inspect the physical product before purchase, therefore increase the risk of the purchase. They can only depend on online and offline word of mouth when deciding to purchase to reduce their perceived risk. Consumer confidence

in the purchase is greatly influenced by the reviews and ratings of earlier purchasers, reducing the perceived uncertainty on the purchase (Hu *et al.*, 2008). Furthermore, online reviews, social network reviews, websites or app reviews are found to influence consumer purchases (Yeo *et al.*, 2021). This research has clearly shown that the views and recommendations of social groups influenced the perception of the usefulness of technology positively and reduced the perception of risk by generation Y.

Hypothesis 2a proposed that mobile app features have a negative effect on adoption reluctance, and Hypothesis 2b proposed that experience moderates the relationship between features of mobile apps and adoption reluctance. The result shown that both hypotheses were not supported with $\alpha=0.145$ and $.664$, respectively. Although mobile app quality found influenced the installation and adoption of food delivery apps (Cho *et al.*, 2019) which include food choice variety, fair price, timely delivery, user-friendly design, and trustworthy delivery; for Generation Y, price may be the most important factor considered when choosing a food delivery mobile app. Other factors like outdated and deceptive information in mobile apps, such as price, minimum order charge, complicated interface, and a deceptive menu, have led to consumer confusion and reluctance to use (Kaur *et al.*, 2020).

Prior experience on usage of apps may reduce the anxiety faced by the user due to the complexity of mobile apps (Sun and Zhang, 2006). On the other hand, consumers without prior experience, knowledge, and cognitive capacity may face difficulty dealing with unfamiliar mobile apps and cause resistance to use new mobile apps. Non-users of food delivery services were found to refrain from using the service due to the lack of skill in performing online purchases (Schnellbacher *et al.*, 2015). However, due to MCO adherence, food delivery apps may have become a more convenient ordering method. The risk involved may have been avoided by using familiar apps. These findings can be seen from the rejection of hypotheses that mobile app features have a negative effect on the adoption reluctance towards food delivery apps while experience is moderating the relationship between features of mobile apps and adoption reluctance towards food delivery apps.

Hypothesis 3a proposed that perceived risk has a positive effect on adoption reluctance. The result revealed that perceived risk does positively affects adoption reluctance ($\alpha = .000$, $\beta = .369$). Perceived risk is found to influence the actions of consumers (Baucer, 1960) and is supported by Stone and Gronhaug (1993). Perceived risk is found to increase the adoption resistance of consumers in purchases (Gupta and Duggal, 2021; Gupta *et al.*, 2018). It is also found negatively influence Malaysian Generation Y purchases online (Mazzini *et al.*, 2016). Consumers' perceived risks involved in food delivery, such as unhygienic food, food freshness due to road congestion, technology anxiety, have led to resistance to using food delivery service and food delivery service apps (Gupta *et al.*, 2018; Kimes, 2011).

Hypothesis 3b posited that experience moderates the relationship between perceived risk and adoption reluctance. The result revealed that experience negatively moderates the relationship between perceived risk and adoption reluctance ($\alpha = .000$, $\beta = -.135$). Thus, H3b is supported. Results in table 4.0 shown significant relationships between perceived risk and acceptance reluctance, experience and acceptance reluctance and the interaction of perceived risk and experience toward acceptance reluctance. These results substantiated the moderation effect of experience toward the relationship of perceived risk and acceptance reluctance (Hayes, 2017). This finding is supported by Pires *et al.* (2004), who finds that the repetition or familiarity of the consumer with specific processes will reduce their perceived risk towards those processes or acts. Through experience by using food delivery apps, users may find the perceived risk reduced over time, and familiarity with the apps may reduce their anxiety toward using the apps. With the app's familiarity, consumers and the delivery service personnel and provider will become familiar with the process, and the need for more information and inappropriate conduct will be significantly reduced. Therefore, it will reduce the reluctance of adoption (Kaur *et al.*, 2020). The consumer with prior positive experience would see a reduction in needs for more information and communication and perceived risk, resulting in a reduction in adoption reluctance (Gupta and Duggal, 2021; Kedah *et al.*, 2015 and Kimes, 2011).

IV. CONCLUSION AND IMPLICATIONS

To conclude, this study investigates Generation Y in Malaysia who had experiences in using the OFD services. TAM model has been utilised to support the theoretical stance of this study. The findings of this study were based on the 205 sets of responses gathered from Google Form, where the data were analysed using IBM AMOS software. Notably, this study highlights that almost 50 per cent of the respondents are new users of OFD services. They have begun to use the services only during the MCO period. The statistics of new users adopting OFD services align with the worldwide claim that attributes the sudden growth in the OFD segment following the Covid-19 outbreak. The descriptive statistics indicate that, on average, all the respondents agreed with the Feature of Mobile Apps and Experience construct.

On the other hand, the respondents had neutral responses towards the construct of Adoption Reluctance, Social Influence and Perceived Risks. Meanwhile, the results of path analysis reveal a significant impact of Social Influence towards the key determinants of Adoption Reluctance. These key determinants, Feature of Mobile Apps and Perceived Risks, had insignificant and significant relationships with the Adoption Reluctance, respectively. Additionally, Experience has a weak moderation effect between key determinants and Adoption Reluctance. Nevertheless, the moderation effect was insignificant on the relationship between the Feature of Mobile Apps and Adoption Reluctance.

Based on the findings of this study, almost 50 per cent of Gen Y have started to use the food delivery service during the MCO. This situation might be due to the situational

circumstances of the COVID-19 pandemic, and the enactment of the Movement Control Order impeded Malaysians from carrying out numerous physical activities (Wong, 2020). If this is the case, the usage of OFD services will return to pre-COVID-19 figures after the pandemic subsides. As widely perceived, retaining customers is cost-effective than attracting new customers. Pandemic has been somehow instrumental in bringing in new customers for the OFD services. Now, it is the responsibility of the practitioners to find ways to retain these new customers. Improvement in the Mobile Feature Apps is among others to retain these new users of OFD services. Past studies have empirically demonstrated that the Features of Mobile Apps can be a double-edged sword. The superior features would facilitate the adoption rate (e.g. Cho *et al.* 2019) and vice versa to the weak features (e.g. Kaur *et al.* 2020). Thus, this study insists that the practitioners, especially the Restaurant Operators, keep enriching their OFD services mainly by enhancing mobile apps features. Restaurant operators who are a novice to the OFD services can engage the Mobile Apps consultants or developers to develop or improve the interface of their apps. With the improved Mobile Apps Features, the users are expected to have positive experiences with the OFD services. A positive experience is essential to retain the users, especially the new users, for continuously subscribing to the OFD services even during the post-pandemic.

Restaurant and Platform Operators should devote adequate efforts and attention to content marketing in line with other key findings of this study, i.e. the significant role of Social Influence. Given the nature of the business operation that inherently utilises the online tools, the practitioners should use digital content marketing to feed the customers' curiosity through various channels. Digital content creation is relatively more straightforward and cost-efficient. A designated staff shares the company details through the storytelling approach could be used (Kee & Yazdanifard, 2015). A recent study on 707 Chinese gastronomy tourists discovered that informative and entertaining content has a positive social impact, leading the respondents to easily engage in electronic word-of-mouth (Bu *et al.* 2021). Accordingly, the current study proposes that practitioners ensure the content shared to be informative and entertaining and avoid exaggerated content.

Of the two key determinants, only Perceived Risks are found to influence the Adoption Reluctance significantly. It is interesting to note that the significant effect of Perceived Risks is valid even during the pandemic, contrary to the insignificant role of Features of Mobile Apps. Therefore, the practitioners should formulate strategies to reduce the perceived risks as much as possible to reduce the users' adoption reluctance and hence the continuous adoption intention of OFD services. For example, the inclusion of experience sharing by the famous local figures as part of the content marketing and provision of assurance in terms of on-time delivery, food quality, and reasonable pricing are among others to reduce the perceived risk of users towards the OFD services.

This study takes pride in contributing to the literature on the negative agenda of the OFD services. It is despite the OFD's existing popularity and its sudden growth due to the MCO imposition. Researchers believe both sides of OFD services should be explored to furnish the accurate details of OFD services to the stakeholders for their decision-making process. Additionally, this study contributes additional empirical evidence on the crucial role of non-technological aspects, especially Social Influence, in affecting electronic consumer behaviour.

V. LIMITATIONS AND RECOMMENDATIONS

This section summarises the limitations of the current study and proposes relevant recommendations for future research. First, the results of this study revealed that social influence, features of mobile apps, and perceived risks explain 28.7 per cent of the variance explained for adoption reluctance among Generation Y in Malaysia. Consequently, there could be other constructs to adoption reluctance. Future research could be directed to include other constructs that are also crucial in studying the adoption reluctance. Second, this study has conducted a short-term reflection of generation Y users' perception towards adoption reluctance OFD services, especially in a particular situation (COVID-19 pandemic context). It is recommended the future research to apply longitudinal and experimental methods to explore users' perceptions in different situations, investigate causality over time, and make comparisons to explain users' continuance usage intentions of technology more comprehensively.

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Correlates of School Support and After School Activities to Academic Performance of the Tau Student Athletes SY 2018 - 2019

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Abstract

The purpose of this study is to propose a sports development program for the university by determining how school support and after school activities affect the student-athlete performance of Tarlac Agricultural University. This study aims determine the importance of school support and school activities of the student-athletes of Tarlac Agricultural University. The study used descriptive-correlational research design to find relationships of the variables involved. The salient findings of the study are as follows: That there were more male student-athletes than female, most of the student-athletes involve in ballgames as sports discipline and most of the student-athletes were middle performers. On the school support, the student-athletes of the university has training and clothing allowance. But claimed that they have no monthly allowances, athletes' insurance, and housing. It was also found out that most of the student-athletes were hooked up in social media platforms as their after school activities, rather than to work on their courses' requirement, training for improvement and hanging out with friends. On the relationships, it was found out that there is a significant relationship between the after school activities of student-athletes to their academic performance. With regards to the after school activities of student-athletes and to their athletic performance, it was found out that these two were significantly related based on the data gathered. It was also found out that there is a significant relationship between the athletic performance of the student-athletes to their academic performance.

Index Terms

Student-athletes, school support, school activities, academic performance

I. INTRODUCTION

Sports have become a major shift and attraction for students nowadays in the Philippines. The prints, radio, television and internet media have contributed much to the popularity of both professional and amateur sports in the country. Millions of pesos if not billions of pesos are spent on the upgrading of sports facilities and training of athletes. It is not surprising, that the popularity of sports has been reflected in the programs of every colleges and universities in the country. As reflected in Article 15, Section 19 of the 1987 Philippine Constitution that “ the State shall promote physical education and encourage sports programs, league competitions, and amateur sports, including training for international competitions, to foster self-discipline, teamwork, and excellence for the development a healthy and alert citizenry.” Also, under Section 6 of Republic Act 6847 mandates the Philippine Sports Commission (PSC) to set the priorities and direction of a national sports agenda, giving emphasis to grassroots participation.

Multiple times a year throughout the country, researchers, administrators, students, sports fans, and coaches gather at sport-related conferences to hear panels debate the most predominant issues and how they will affect the future landscape of sports in the country. Athletics versus academics has been at the forefront of sports in colleges and

universities for many years and serves as the underlying questions for other issues as well.

In SCUAA student athletes must carry a load of at least 12 units per term and maintain a 60 percent passing mark. The rules are non-negotiable as they should be because no league will want a varsity athlete playing for a school without going to class or flunking his course. This means student athletes must know how much to sacrifice in academics for sports because if they forego studies completely, they jeopardize their athletic eligibility. On his column, Sporting Chance, Joaquin Henson of Philippine Star, cite the program of Ambassador Cojuangco which started on the year 2013 – 2014, for the La Salle basketball men team. The program started with career visioning for athletes which has career counseling and testing, the program also include orientation of parents of athletes to explain the concept of the program. Dr. Coscolluela of La Salle, who conducted the program said, “The faculty will be oriented on the goals, policies and procedures of the varsity sports program, the practice schedules, the peak varsity competition periods which may require adjusted class schedules and make-up classes,” she said. “The faculty will also be encouraged to use differentiated teaching strategies that enable students to find meaningful ways of learning that are attuned to their styles and domains of interest”. Perhaps, other schools may

consider undertaking a similar program to prepare their athletes for life after school.

Similarly, it is possible that athletic communities in state universities and colleges have developed a negative reputation with respect to the performance in academics. After school programs have become a developmental for young people but the current social, political and economic climate continue to pose the following challenges: funding, program sustainability and expansion, quality improvement and maintenance and programming to meet the needs of an increasing diverse group of athletes, this is according to James Bartlett Presbrey, (2017) on his study entitled “The Development and Sustainability of Sports-Based Youth Development Programs as a Viable Options for After-School Programs”. Burns et. al. (2013), on their study “Academic Support Services and Career Decision-Making Self-Efficacy in Student Athletes”, found out that academic support services were positively related to levels of career decision-making self-efficacy of student athletes.

Recent research has begun to investigate the influence of school support and after school activities to student athletes. Recently, the NCAA has created metrics to examine the academic performance of student-athletes such as the Academic Progress Rate (APR) and the Graduation Success Rate (GSR). Previous investigations have provided insights into the recent focus on academic performance of student-athletes. Grit (2014) stated that, when it comes to education of student-athletes, most research focuses on GPA and traditional educational views. She also found out that student athletes do better in school than their peers. The broad goal of the Commission on Higher Education, however, is to prepare individuals for the rest of their lives and develop productive members of the society. Research suggests that participation in athletics is motivating student-athletes in the classroom in terms of better time management and motivation to attend classes, Byrd and Ross (1991). School varsity athletics provides an opportunity for holistic education, yet little research has been done to understand the overall impact of athletics through investigating the school support and school activities and the well-being of the student-athletes.

School varsity athletics supporters counter that the time commitments create structure and routine that often support academic success and can help overcome risk factors. Athletics participation itself provides non-traditional education that aids in the overall development of young people, contributes to increased academic performance of student-athletes. This was proven in the study of Gayles & Hu (2009), with their research findings that engagement and sport participation of students had also motivated them to engage in educationally purposeful activities and the impact of their experiences on cognitive and affective outcomes.

As teachers, student advisers and coaches of student-athletes, the researchers noticed that there is not much research conducted in this area of endeavor, also the researchers observed that the factors involve in this study is not given priority in past researches conducted. This motivated the researchers to look into the importance of school support and after school activities of the student-athletes as to the

relationship of their academic performance and athletic performance.

The purpose of this study is to propose a sports development program for the university by determining how school support and after school activities affect the student-athlete performance of Tarlac Agricultural University.

Objectives of the Study

This study has the following objectives;

1. To describe the student-athletes of TAU in terms of the following;
 - a. Sex;
 - b. Age;
 - c. Academic performance;
 - d. Sports involvement; and
 - e. Athletic performance.
2. to determine the school support given to student athletes.
3. to determine the after school activities of the student athletes.
4. to determine the relationship between after school activities and academic performance of the student-athletes.
5. to determine the relationship between after school activities and athletic performance of the student athletes.
6. to determine the relationship between athletic performance and academic performance of the student-athletes.

II. METHODOLOGY

This chapter presents the methods of the study, namely the research design, locale of the study, data gathering instruments, data gathering procedures and statistical tools to be used.

Research Design

The study will make use of the descriptive-correlational research design to find relationships of the following variables; school support, after school activities, academic performance and athletic performance of the Tarlac Agricultural University student-athletes. The descriptive will be employed in determining the school support and after school activities of the student-athletes. Correlational because it will determine the extent to which the school support, after school activities, academic performance and athletic performance correlates each other.

The study used Questionnaire Checklist to answer the specific problems of the study. It was subjected to validation by experts and the suggestions and their suggestions were considered in the finalization of the checklist.

III. RESULTS AND DISCUSSIONS

This chapter presents the findings of the study which aimed to determine the effects and looked for the relationship of school support and after school activities of TAU student-athletes. It also presents the discussion and interpretation of the results of the analysis.

Table 1. Profile of TAU Student-athletes

Sex		Age			Athletic Involvement					Athletic Performance		
M	F	16-18	19-21	22-25	Ball Games	Athletics	Martial arts	Archery	Swimming	Champion	Middle Performer	losing
30	25	20	30	5	24	15	8	6	2	2	45	8

It can be gleaned on the table that there were 25 females of the TAU student-athletes and 30 were all males. Furthermore, most of the athletes were at the age of 19-21 which indicates that they are still in the midst of their prime as student-athletes. Along their involvement in sports, most of them belong to the ball games followed by athletics,

martial arts, archery and swimming. With regards to their athletic performance, most of the student-athletes are middle performers; this was based on the number of athletes that 45 of them are middle performer out of 55 respondents. This result indicates that the Tarlac Agricultural University (TAU) student-athletes need to perform better in their own respective sports discipline.

Table 2. School Support of TAU Student-Athletes

	Monthly Allowance	Clothing Allowance	Athletes Insurance	Training Allowance	Athletes Housing	Sports Development Program
No. of Students	0	55	0	55	0	6
%	0	100	0	100	0	10.90

The table 2 presents the School support of Tarlac Agricultural University (TAU) student-athletes. It can be seen on the table that all the student-athletes receives clothing allowances in terms of competition uniforms and training allowances. But there were only 6 or 10.90 percent receives sports development in terms of their respective sports discipline. Furthermore, it was also found out that there is no housing, athlete insurance, and monthly allowance for all

student-athletes in the university. This contradicts the study of Hartman & Kwauk (2011), on their study, "Sport and Development: An Overview, Critique, and Reconstruction", which states the general purpose is to show that practitioners interested in using sport for development however defined must acknowledge these theoretical issues and create appropriate programming if their intended outcomes are to be achieved.

Table 3. After School Activities of Student-athletes

Number of student-athletes (n = 55)	Courses' requirements (assignments, projects/outputs)	Hanging out with friends	Hooked in multi-media platforms (facebook, instagram)	Still training for improvement
F	20	7	30	17
%	36.37	12.72	54.54	30.90
Rank	2	4	1	3

In table 3, the after school activities of the student-athletes were presented. It shows that student-athletes hooked in multi-media platforms with 30 or 54.54 percent which rank first, followed by doing their courses' requirements with a frequency and percentage of 20 and 36.37 respectively, at rank third is still training for improvement which has a frequency and percentage of 17 or 30.90, while the last is hanging out with friends with a frequency of 7 or 12.72 percent. This only means that most of the student-athletes

were hooked into multimedia platforms as their after school activities rather than doing their courses' requirements or have their training after class to improve their capabilities. These findings were agreed to the findings of Fraser-Thomas in her study, "Youth Sports Programs: An Avenue to foster positive youth development", that the importance of sport programs built on developmental assets and appropriate setting features in bringing about the five C's of positive development (competence, confidence, character, connections, and compassion/caring).

Table 4. Relationship between After School Activities to Academic Performance

Variables (n = 55)	Courses' requirements (assignments, projects/outputs)	Hanging out with friends	Hooked in multi-media platforms (facebook, instagram)	Still training for improvement
Correlation Coefficient	0.004	-0.021	0.187	-0.220
Sig (2-tailed)	0.979	0.881	0.173	0.107

Legend: test at $\alpha = 0.05$ level of significance

In the table 4 above, it shows that there is a significant relationship between the after school activities to the academic performance of student-athletes. It further shows that doing courses' requirements and hooked up in social media platforms has positive relationship while the hanging up with friends and training for improvement shows negative relationship to academic performance. This could only mean that doing courses' requirements and hooked up with multimedia platforms has an effect to the academic performance of the student-athletes. This is aligned with the

study of James Bartlett Presbrey, (2017) on his study entitled "The Development and Sustainability of Sports-Based Youth Development Programs as a Viable Options for After-School Programs", whose findings states that after school programs have become a developmental state for young people but the current social, political and economic climate continue to pose the following challenges: funding, program sustainability and expansion, quality improvement and maintenance and programming to meet the needs of an increasing diverse group of athletes.

Table 5. Relationship between After School Activities to Athletic Performance

Variables (n = 55)	Courses' requirements (assignments, projects/outputs)	Hanging out with friends	Hooked in multi-media platforms (facebook, instagram)	Still training for improvement
Athletic performance				
Correlation Coefficient	0.004	-0.144	0.065	0.033
Sig (2-tailed)	0.979	0.295	0.636	0.812

Legend: test at $\alpha = 0.05$ level of significance

The table 5 shows the relationship between the after school activities to athletic performance of the Tarlac Agricultural University (TAU) student-athletes. It shows that there is a significant relationship between after school activities to their athletic performance. Furthermore, doing courses' requirements, hooked in social media platform, and still training for improvement shows positive relationship to athletic performance and only the hanging out with friends shows negative relationship. This could only mean that these factors will greatly affect the athletic performance of the student-athletes.

requirements, hooked in social media platform, and still training for improvement shows positive relationship to athletic performance and only the hanging out with friends shows negative relationship. This could only mean that these factors will greatly affect the athletic performance of the student-athletes.

Table 6. Relationship between Academic Performance to Athletic Performance

Variable	Academic Performance	Athletic Performance
Correlation Coefficient		-0.035
Sig (2-tailed)		0.799

Legend: test at $\alpha = 0.05$ level of significance

The table 6 shows the relationship between the academic performance to athletic performance of the student-athletes of the Tarlac Agricultural University (TAU). It can be gleaned on the table that there is a significant relationship between the academic performance to the athletic performance of the student-athletes. The academic performance has slight effect on the athletic performance of the student-athletes

IV. Conclusion

Based on the findings of the study, the following conclusions were formulated:

1. Most of the student-athletes were middle performers and prefer ball games as their sports discipline.
2. School support is not adequate to maintain student-athletes in order for them to perform well.
3. Most of the student athletes were hooked up in social media rather than have their focus in doing their courses' requirements and training.
4. After school activities of student-athletes were significantly related to their academic performance.
5. After school activities and athletic performance of the student-athletes were significantly related.
6. The athletic performance and academic performance of the student athletes indicates relatedness.

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Introduction to Solving Logical Problems in General Education Schools

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Abstract

The reports in this article are based on the regional characteristics of some regions and cities of the Republic of Kazakhstan. Solving problems by conducting a deep analysis of a given problem condition without using memorized formulas in solving logical problems helps to improve students' thinking skills. The compiled reports correspond to the content of education in the 6th grade of a general education school. Mathematical model of a text problem by finding a part of a number, finding a number by part, Euler-Venn diagram, calculation of proportion, path, speed, drawing up a scheme, a student gets used to creating a problem. Since the reports are about the nature of their land, they arouse students' interest and contribute to becoming Patriots of their country.

Index Terms

Euler-Venn diagram, logic, mathematical model, proportion, text tasks, scheme.

I. INTRODUCTION

In this scientific project, the method of transmitting logical problems to students is unique. I considered the problems of developing logical thinking of a student in connection with the regional characteristics of our country. This project has a lot to give to students. Reports based on regional characteristics have a very high spiritual and educational significance. First of all, in the process of completing these tasks, a student gets acquainted with beautiful places of our country. Secondly, it is obvious that a student who knows the richness of his native land will feel a sense of love, and pride for his homeland, so he will become a patriot of his homeland. Third, of course, a patriot becomes a great person who makes a huge contribution to the prosperity and development of his country.

II. Main part

Logical problems based on local features that develop the ability to think logically will be easier for students not only to develop mathematical logic, but also to reproduce it. Because in Kazakhstan, where he was born and lives, it is not difficult to imagine and understand things, objects that he fully knows. Currently, Kazakhstan is divided into fourteen regions. There are three cities of national significance in the country. These are Nur-Sultan, Almaty and Shymkent.

It is obvious that this will be a novelty for pupils in solving problems in special places located on the territory of Regions and megacities of national significance.

Task 1. The Almaty city.

The length of the suspension track at the ski resort "Shymbulak", located in the Trans-Ili Alatau Gorge, is 4.5km. With the suspension line, you can climb to the base in 15 minutes. How far can you go in 1 hour, counting on the suspension road?



Picture 1 - Shymbulak ski resort

Resolution: 1 hour = 60 Minutes

60: 15=4 (rises once)

4.5 · 4 = 18 (km).

Answer: 18 km. [9].

Task 2. West Kazakhstan region.

The Ural is a river that separates Europe and Asia. The Ural River, which originates in Bashkortostan and stretches across the territory of Kazakhstan, flows into the Caspian Sea. The length of this river, which flows through the West

Kazakhstan region, Uralsk, Aktobe, Atyrau, is 1084 km in Kazakhstan. In the spring months, the river flows rate is 10 km/h. it will go up. After leaving the Caspian Sea and sailing along the Ural River for 7 hours at a speed of 42 km/h, the boat will stop for 1 hour and continue its journey, increasing its speed to 8 km/h. How many hours does the boat take to leave the territory of Kazakhstan?



Picture 2- Ural River

Solution:

$v = 42 - 10 = 32$ (km/h) swim against the current, because it swims in the opposite direction;

$S = 32 \cdot 7 = 224$ (km) swimming path to the stop;

$S = 1084 - 224 = 860$ (km) the rest of the way;

$v = 32 + 8 = 40$ (km / h)

$t = 860 : 40 = 21.5$ (H)

$t = 21,5 + 7 + 1 = 29.5$ (H)

Answer: 29.5 hours. [9].

Task 3. Mangystau region.

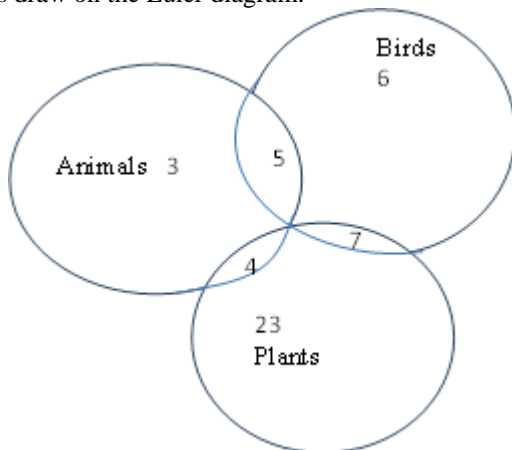
The Ustyurt Reserve in Mangystau region is the largest reserve located in the desert zone. This reserve contains 336 species of plants, 45 species of animals and 166 species of birds. Of the researchers who visited the Ustyurt nature reserve, 12 study animals, 18-birds, and 34-plants. 5 of them study birds and animals, 7 study birds and plants, and 4 study plants and animals.

1) How many researchers are there in total in the Reserve?

2) how many people study only animals?

Solution:

Let's draw on the Euler diagram.



Picture 3 – Euler circles method

We see on the Euler diagram there are 48 researchers in total. There are 3 researchers study only animals.

Answer: There are in all 48 researchers and 3 researchers study only animals.[9].

Task 4. Atyrau region.

The average depth of the Caspian Sea is 1025 meters, and the bathyscaph was lowered to reach the bottom. How many seconds will it be on the surface of the water if the bathyscaph rises to the surface of the sea at a speed of 1.8 km/h from the depth of the sea?

Solution: $1.8 \text{ km} / \text{s} = 1.8 \cdot \frac{1000}{3600} = 0.5$ (m / s)

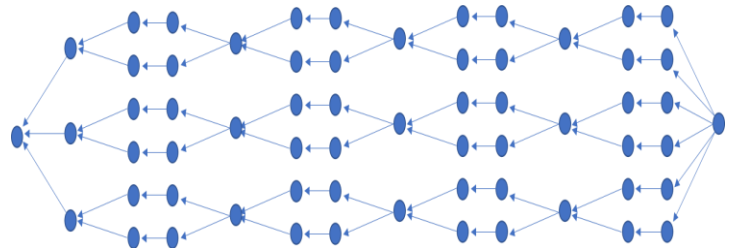
$1025 : 0,5 = 2050$ (s)

Answer: 2050 second. [3].

Task 5. North Kazakhstan region.

There are 62 large lakes in the North Kazakhstan region. From one lake on the east side of these lakes, a group of 6 researchers came out in six directions to the west. Each of them meets each other in every third lake next to each other. They say: if it is known that groups 1 and 2, 3 and 4, 5 and 6 meet, how many times do 1 and 2, 3 and 4, 5 and 6 meet when they reach the last Lake?

Solution: we show it as a scheme.



Picture 4 – Scheme of solution

According to the condition of the task, we draw groups and their meetings.

And so we see from the scheme that the tourists met 4 times. Answer: 4 times. [9].

Task 6. East Kazakhstan region.

One of the relict ribbon Pine chalk, which is found only in two places in the world, is distributed from the East Kazakhstan region to the Altai territory, and the other in Canada. Three Irtysh Pine Bors with a length of 115 km each cover an area of 150 thousand hectares, 210 thousand hectares and 220 thousand hectares. Well, 1 ha of forest absorbs 280 kg of carbon dioxide and releases 220 kg of oxygen. How much carbon dioxide does it absorb and release oxygen, including all the parts of this boron?

Solution: $150\,000 + 210\,000 + 220\,000 = 580\,000$ (Ga)

$580\,000 \cdot 280 = 162\,400\,000$ (kg)

$580\,000 \cdot 220 = 127\,600\,000$ (kg)

Answer: 162.4 million.kg of carbon dioxide absorbed 127.6 million.kg releases oxygen. [9].



Picture 5 – Pine forest

Task 7. Almaty region
 Charyn canyon, located in Almaty region, stretches along the Charyn river with a length of 154 km. How many hours do travelers spend shooting videos from a height, shooting a conch with a drone flying at a high speed of 70 km/h?



Picture 6 – Charyn canyon

Resolution: $154:70 = 2.2$ (h)
 Answer: 2.2 hours. [9].

III. Objectives of the study

The purpose of the study is to instill students' love for nature, the country and the land

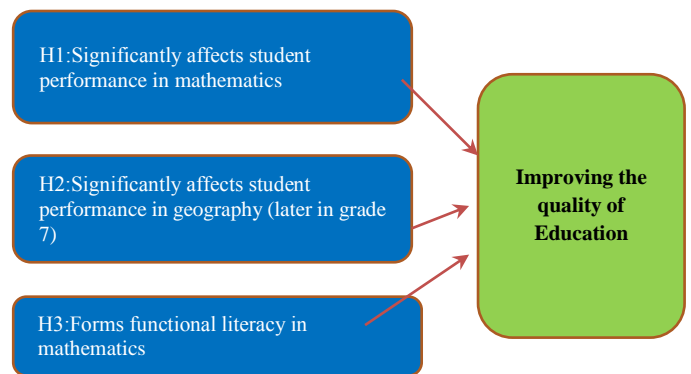
Specific objectives were to:

1. Familiarization of students with the features of Kazakhstan.
2. Teach you how solve text problems logically.

Hypotheses

- 1) Significantly affects student performance in mathematics.
- 2) Significantly affects student performance in geography (later in grade 7)
- 3) Forms functional literacy in mathematics.

Model



Research method

The study used complementary system methods:

Theoretical: analysis of psychological, pedagogical and methodological literature, analysis, generalization, systematization of factual data; control method.

Experimental: the stage of analysis, identification, formation and control of pedagogical and psychological documents, methods of processing results (quantitative and qualitative analysis of the data obtained).

Data Collection

In the collection of the material, the Encyclopedia of Kazakhstan and passports of each region were used.

IV. Conclusion

Today, in general, due to the rapid development of new technologies, no matter what industry we take, we need innovative ideas and methods. The teacher must first instill in the student invaluable, immeasurable values. It should be noted that humanity, patriotism, kindness, truthfulness, punctuality and many other qualities. Mathematic has a special place in science and in the comprehensive development of human thought. The basis of mathematic has never changed, but the requirements for its effective teaching are high for modern pedagogy. Therefore, the teacher should always be on the lookout and has high demands on the students who are brought up before him. And the impact of logical problems in mathematic on the development of students' thinking is huge. This is because these calculations require thinking in a different way than standard calculations.

V. Recommendations

Based on the results obtained, it is better to take as a basis interdisciplinary continuity in high school mathematics. The use of nature, homeland, and regional features at every lesson to improve students' cognitive activity allows you to conduct math lesson more interestingly and effectively. It is necessary to develop the skills of logical output text problems.

1)

Financing: this study was not funded. The study was conducted on a voluntary basis.

Conflict of interests: the authors have no conflicts between themselves. The order of authorship is agreed in advance.

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Adoption Factors of FinTech Products & Services in Islamic Banking Industry in Malaysia: A Literature Review

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Abstract

FinTech is an innovation of technology to perform financial transactions for banking industry. Many studies have been conducted to explore and examine the factors that influence the adoption factors of FinTech among the users especially in financial industry. This study was conducted to explore the common factors that give an impact to the adoption factors of FinTech based on the secondary data obtained from the previous research. It can be concluded that most important factors that reflect the adoption of Fintech are perceive ease of use and perceive of usefulness. The study also revealed that users' trust in FinTech services has a very significant influence on users' attitudes for adoption. Therefore, the provider of FinTech especially the financial industry should emphasize to improve the efficiency of the potential users and how the services can lead to cost-saving to the user as compared with the conventional channel of doing transactions. Besides that, it is also important to ensure the understanding of the users and improve the user's experience of using the FinTech products and services. The study also revealed that the users need to give an assurance that the data is fully secured and protected and has highly reliable cybersecurity features. This study contributes to the literature of the adoption of FinTech services by providing a more comprehensive view of the determinants of users' adoptions toward FinTech by combining trust of Fintech services as well as attitude with the theory of Technology Acceptance Model or TAM.

Index Terms

FinTech, adoption factors, TAM, financial industry, user's trust

I. INTRODUCTION

Nowadays the emerging of advanced technology has developed a new era of financing ecosystem. The financial institution regardless of conventional or Islamic financial institution should move forward and accept the changes of the technology and the world of digitalization in promoting products and services to the customers. The advancement of technology¹ facilities can ease the customers with the provision of fast and efficient financial service facilities as well as to help financial institutions to grow their business. The financial technology of FinTech is a process to link via an online connection between the customers either individual or enterprise through an internet connection or mobile

technology². The solutions provided by the FinTech not only the e-payment and e-wallet but also other FinTech solutions that can be benefitted to ease the transactions of the users. There are various types of financial technology or FinTech such as big data, artificial intelligence, robotics, blockchain, cryptocurrency, and mobile phones³. In the financial industry, the acceptance and usage of FinTech among the users is still not up to the expectation level. There are a lot of studies were conducted to examine and explore the adoption and acceptance factor of FinTech among the users of the financial industry. Therefore, this research is secondary whereby the approach is to review the result obtained from

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[³] Qatar Financial Centre, 2018, FinTech, A Global Boost For Islamic Finance? Retrieved from <https://www.reuters.com/sponsored/article/FinTech-a-global-boostfor-islamic-finance>

Acknowledge: This article writer wishes to express her appreciation to Universiti Teknologi MARA that funds the publication of this research project 600-RMC/GIP 5/3 (064/2021).

the past research regarding the adoption factors of FinTech products and services. The result of the study is very useful to all the stakeholders to focus on constructing the module and the program to enhance the adoption of FinTech in tandem with the extensive development in information technology. This research is to add to the existing literature and to accomplish the gap as well as to fulfil the previous research gaps and to expand the knowledge about awareness and adoption factors of FinTech among the users, particularly in the Islamic financial industry.

II. BACKGROUND

The acceptance level and development of financial technology or FinTech is still quite slow. The industries, as well as the regulator, are still in the process of understanding to match the applicability of financial technology and the adoption factors as well as the features of the Fintech to the users. This is happened especially among the users of Fintech among the Islamic Banking customers. As a result, it will give some negative implications to the Islamic finance industry specially to compete with conventional banking to access financial services through digital means. The adoption of digitalization is neutral in Shariah provided it is complying with Shariah compliance not only to the FinTech provider but also by the end-users.

According to FinTech Malaysia report, the usage of FinTech is dominated by the e-payments and e-wallet in which e-payment usage has increased from 18% to 19% and e-wallet also has increased from 12% to 17%. The rest of the FinTech solutions are still reported as a single digit. The report also stated that the usage of e-money especially from mobile and internet banking contribute about 29% of the total volume of payment transactions. Internet banking is still the biggest channel of transaction. However, the transactions of internet banking from the individual only contribute 12% and the rest of the contribution is from the corporate transactions⁴. The BNM reports stated that out of 24 Million adult populations, almost half of them were not using the online banking solution, and while about 2 million remain unbanked.⁵ Further study is important to investigate the awareness and acceptance level of the society especially towards the Islamic FinTech solution as their choice of financing solution.

Small and medium enterprises (SMEs) are making up more than 35% of Malaysia's gross domestic product. The industry has great potential to grow to new heights with the availability of FinTech. The adoption of new technology will provide advantages in various aspects to the SME. Some of the benefits such as FinTech will provide a platform for the SME to raise their working capital. For instance, with the adoption of blockchain technology, SMEs can provide Islamic crowdfunding platforms to potential investors to invest in their company. The concept of Mudharabah, Murabahah, and Musyarakat can be implemented under the

crowdfunding platform which is in tandem with the Islamic concept of financing (The Edge, 2019). Therefore, the adoption of FinTech not only focus on e-wallet and e-payment but also to other FinTech solution such as crypto-currency, Peer-to-Peer (P2P) lending, crowdfunding, and InsureTech. According to World Bank in the year 2017, Malaysia has projected a strong growth of 12.5% in the FinTech industry until 2023. While Malaysian banks are aiming to transform their approach to be more digital-focused by 2020. Islamic FinTech is still in its infancy and needs much afford to explore the awareness and adoption factors that influence the acceptance of FinTech among the customers of Islamic banking in Malaysia. Since Malaysia had already been recognized as a world leader in Islamic finance, then it is in a strong position to harness Islamic FinTech opportunities. Therefore, the research is on the right time to explore and investigate the awareness and the adoption factors that influence the acceptance of FinTech among the customers of Islamic banking in Malaysia.

III. MOTIVATION

Overview of Financial technology (FinTech)

Financial technology or FinTech is a combination of an innovative business model and technology solutions in facilitating daily financial services. FinTech has brought tremendous development in the digital economy and reflect the changes in the financial ecosystem. The common products for FinTech include e-wallet, crypto-currency, Peer-to-Peer (P2P) lending, crowdfunding, and InsureTech have become the major financial alternatives for consumers and businesses.⁶ In a year of pandemic, FinTech is the best choice of transactions method specially to meet the requirement to maintain a social distancing. The usage of FinTech is expected to be a substitute to the conventional way of making transactions especially in financial services.⁷ The utilization of mobile applications, portable and mobile banking are among the types of advancements in financial services to cater to the wide coverage of the population.⁸ However, the level of awareness and acceptance toward the adoption of FinTech is quite low.⁹ Therefore, it is very crucial to investigate the awareness and acceptance of FinTech and factors that influence the awareness towards the usage of FinTech, especially in the era digitalize revolution.

The Malaysian Fintech Ecosystem

According to the speech by Malaysia's ex-center bank Governor, Dato Muhammad Bin Ibrahim stated in the Global Islamic Finance Forum 5.0 (GIFF 5.0) "FinTech is challenging the status quo of the financial industry. New business models will emerge. Delivery channels will challenge existing norms. Transaction costs will be reduced.

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^[8] Alber, N., & Dabour, M. (2020).

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Rather than looking at the FinTech revolution as unwelcoming, financial institutions ought to embrace it as an opportunity." The central Bank is expected FinTech revolution will give an impact up to 40% of the income to the financial industry by the year 2025 (Fong, V.,2016). The brief history of FinTech innovation in Malaysia by BNM is tabled below¹⁰

Table 1: The brief history of FinTech innovation in Malaysia by BNM

Year	Initiatives	Explanation
2001	MyKad Implementation	The national Identity card that embedded with ATM card, e-wallet and a transit card all in one
2015	FinTech Regulatory Framework was introduced	To help FinTech company to have proper framework to provide FinTech service while maintaining the stability of the financial services as well as data security. Malaysia is the first country that produce such regulatory framework in Southeast Asia
2016	License was issued by Security commission to 6 equity crowd funding platforms operators	The companies are: Alix Global, Ata Plus, Crowdonomic, Eureeca, pitchIN and Propellar Crowd+.
2019	BNM created a financial technology sandbox framework	Regulatory sandboxes have been in use in the UK, Singapore, and Australia. They help in creating a controlled live environment for a limited period of time to trial fintech solutions for a company.
2020	BNM issued License framework for digital Bank	The licensing Framework seeks innovative business models to support Malaysia's underserved and unserved market segments.

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) (Davis, 1989) has widely used in many researches related to investigate the awareness of information technology in many fields such as agriculture, sociology, education, marketing, and information technology. TAM has been used to devote the understanding and prediction the users' awareness and acceptance of

information systems or technology.¹¹ The factors that derived from TAM such as usefulness of FinTech, ease of use, competitive advantage, perceived risk, and perceived cost are the measuring factors that influence the awareness of FinTech among users.¹² Thus, TAM is a theoretical model that is suitable to study the factors that influence the adoption of technology among the users. Some of the researcher used other theoretical model such as Planned Behavioral (TPB) and AIDA model framework to study the awareness factors related to information technology. Of all the theories, the TAM considered the applicable theory that related to the information technology due to TAM is a simple and very straight forward to investigate and explore and investigate the determination factors that influence the awareness and acceptance level of the technology systems by Muslim SME.¹³ Thus, TAM is much visible to be used in this study other than other theoretical model.¹⁴ TAM has determined the adoption of technology is regulated by perceived usefulness and perceived ease.¹⁵ However, the previous study has proven that some other important factors need to be included under the TAM framework. Under the extended TAM, 4 extra factors that were included as a factor that can influence the awareness and acceptance level of information technology. The factors are usefulness, ease of use, relative advantage, perceived risk, perceived cost and perceived interactivity.¹⁶ The previous study has proven that relative advantage has a significant relationship with the adoption of information technology. Relative advantage is related to adoption of innovation in information technology.¹⁷ Perceived risk is the consumer's perceptions of the uncertainty and adverse consequences of purchasing a product. Perceived risk is an adoption decision when circumstances cause the feelings of uncertainty and anxiety.¹⁸ The perceived cost has significantly and negatively

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^[15] Davis, F.D., 1989. Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technology. *MIS Quarterly*, 13(3): 319-340. Available at: <https://doi.org/10.2307/249008>.
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^[10] Paul, H, 2021. The history of the financial technology (fintech) industry in Malaysia. Retrieved from <http://www.paulhypepage.my/the-fintech-industry-of-malaysia>

influenced on the attitude.¹⁹ Meanwhile the perceived interactivity had an important impact on the attitude.²⁰

Past Researches on FinTech Adoption Factors.

Several studies have been conducted to evaluate the awareness and adoption factors of FinTech in various industries. The followings are the summary of the past research conducted to examine and investigate the awareness and adoption factors toward the acceptance of FinTech.

CITED	TITLE	IV	DV	RESULT
C. C. Jin, et al., 2019	Factors Affecting the Consumer Acceptance towards FinTech Products and Services in Malaysia	i.Perceived usefulness ii.Perceived ease of use iii.Relative advantage iv.Perceived risk v.Perceived cost vi.Perceived interactivity	Intention to use mobile banking <u>Mediation</u> Attitude of adopting mobile banking	The findings revealed that usefulness, perceived cost, perceived interactivity, perceived risk, relative advantage and easefulness have significantly influenced the consumer intention and attitude towards using the mobile banking
Z. Hu, et al., 2019	Adoption Intention of FinTech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model	i.Users' trust in FinTech ii.Perceived ease of use iii.Perceived risk	Bank users' attitudes for adoption FinTech	The results reveal that users' trust in FinTech services has a very significant influence on users' attitudes for adoption. In addition, perceived ease of use and perceived risk does not affect users' attitudes toward the adoption regarding FinTech services.
I. M. Shaikh et al., 2020	Acceptance of Islamic financial technology (FinTech) banking services by Malaysian users: an extension of technology acceptance model	i.Consumer innovativeness ii.Self-efficacy iii.Perceived ease of use iv.Perceived usefulness v.Subjective norms	Islamic FinTech Acceptance	Findings of the study reveal that Islamic FinTech's services acceptance is determined by perceived ease of use, perceived usefulness and consumer innovativeness (CI). Self-efficacy and subjective norms are found not to be influential in determining Islamic FinTech's acceptance by Islamic banking users.
M. Meyliana et al., 2019	The Influence of Perceived Risk and Trust in Adoption of FinTech Services in Indonesia	i.Perceived risk ii.Trust iii.Perceived ease of use iv.Attitude toward use v.Perceived usefulness	i. Attitude toward use ii. Perceived usefulness iii. Intention to use	The results indicate users trusts influences perceived usefulness in the adoption to use FinTech services. Risk factor does not affect the use of FinTech services, which further does not influence the users' attitude.
F. R. Haqqi et al., 2020	Exploring Risk and Benefit Factors Affecting User Adoption Intention of FinTech in Indonesia	i. Perceive Risk ii. Perceive benefit	FinTech Adoption <u>Mediation</u> Trust	Security risk has the biggest negative effect and convenience has the biggest positive effect on FinTech adoption intention
H. Stewart et al., 2017	Data security and consumer trust in FinTech innovation in Germany	i. Customer trust ii. Data security iii. Value added iv. User design interface v. FinTech promotion	Adoption of FinTech	The results confirm that customer trust, data security and the user design interface affect the adoption of FinTech

The adoption of FinTech is related to perceive usefulness and perceive ease of use. Study conduct by Jin (2019), found that among the factors that affect the acceptance of consumer toward the use of FinTech were perceive usefulness, and perceive easefulness. The quantitative study was conducted among the users of mobile banking and was analyzed using

^[19] Kuo, Y.-F. and S.-N. Yen, 2009. Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior*, 25(1): 103-110. Available at: <https://doi.org/10.1016/j.chb.2008.07.007>.

^[20] Wu, G., 1999. Perceived interactivity and attitude toward web sites. In *Proceedings of the Conference-American Academy of Advertising*. American Academy of Advertising. pp: 254-262.

the TAM.²¹ The perceived usefulness is a determination of people acceptance towards the level a particular system to increase the job productivity. It will straight forward reflect the deed of an individual. Meanwhile for perceived ease of use is the determination factors that an individual believes the embracement of the technology is at zero cost incurred. It will not straight forward reflect the deed of individual through perceived usefulness.²² Therefore, it can be seen that the ease of use is very crucial however the usefulness is much more crucial. This is what has been stated under the TAM primary theoretical framework.²³ The researcher has extended the factors by adding additional factors such as perceived cost, perceived interactivity, perceived risk and relative advantage.²⁴

Shaikh et al., (2020) examine the adoption intention of FinTech services among the Islamic bank customers in Klang Valley. The research revealed that the element of trust is the most important factors to determine the adoption factors of FinTech. In this regards the provider of fintect services should able to convince the users especially in terms of mitigating the risk to adopt the FinTech services. Users' trust in FinTech services is a very important factors to influence the respondents towards the adoption of FinTech services. In addition, the study found that perceived ease of use and perceived risk does not have any influential effects toward the adoption of FinTech services provided by the Islamic bank. However according to research conducted by Hu et al., (2019), perceived ease of use and perceived risk does not affect users' attitudes toward the adoption of FinTech services.

Further, Stewart & Jürjens, (2018) was conducted a quantitative study to examine the significant effect of data security and trust towards the intention to adopt the FinTech among the users in German. The study revealed the important aspect of trust and data security to influence their adoption of using the FinTech regardless of promotion and FinTech features created by the developer. Haqqi & Suzianti, (2020) also conduct a study to investigate the effect of trust as a mediation factors to the perceive risk and adoption of FinTech among the Indonesian FinTech users. The study found that trust has significant effect toward the adoption of FinTech among the Indonesian users beside perceive risks and perceive benefit. The important of the study is to determine the adoption as well resistant actors among the FinTech users by looking into several sub factors under perceive risk and perceive benefit. As a result, the study revealed that security risk is the biggest resistance factors while convenience of using the FinTech or perceive of

^[21] Jin, C. C., Seong, L. C., & Khin, A. A. (2019). Factors Affecting the Consumer Acceptance towards Fintech Products and Services in Malaysia. *International Journal of Asian Social Science*, 9(1), 59–65. <https://doi.org/10.18488/journal.1.2019.91.59.65>

^[22] Davis, F.D., 1989. Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technology. *MIS Quarterly*, 13(3): 319-340. Available at: <https://doi.org/10.2307/249008>.

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^[24] Jin, C. C., Seong, L. C., & Khin, A. A. (2019). Factors Affecting the Consumer Acceptance towards Fintech Products and Services in Malaysia.

easefulness is the most acceptance factors of using the FinTech among the users.

Darmansyah, Fianto, B.A, Hendratami, A., & Aziz, P.F., (2020) examine the impact of planned behavior towards the intention of using the FinTech services. Planned behavior is one of the variables under the theory of planned behavior (TPB). Under the TPB, behavioral intentions have significant relationship with attitude and subjective norm as well as perceive control.²⁵ TPB proposes that the probability of individuals performing certain behaviors increases if they believe that the behavior will produce the desired results. The result from the study revealed that beside perceive ease of use and perceive risk, planned behavior is also played an important role in determining the acceptance level of FinTech services.²⁶

Ahmed et al., (2020) conduct a quantitative survey among the users of digital wallet in Bahrain. The result of the survey revealed that the ease of use is the most significant factors to determine the acceptance of digital wallet among the users as compared to perceive of risk. The users adopted the usage of digital wallet due to the convenience and easiness to excess to the financial transactions.²⁷

I. statement of contribution

From the above discussion the following hypothesis and theoretical framework can be concluded:

Hypothesis

H1 There is a positive relationship between trust and adoption of Islamic FinTech.

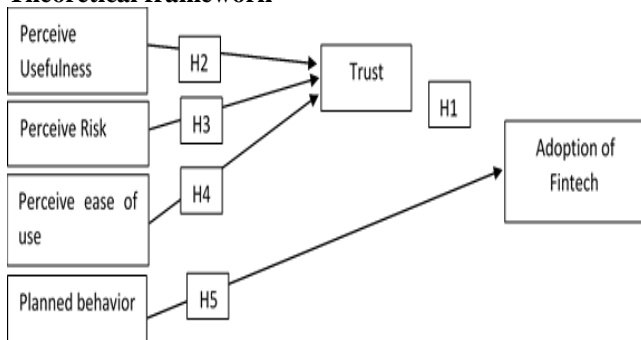
H2 There is a positive relationship between perceive usefulness and element of trust towards the adoption of Islamic FinTech.

H3 There is no significant effect on the Perceive risk and trust towards the adoption factor of Islamic FinTech

H4 There is significant effect on the Perceive ease of use and trust towards the adoption factor of Islamic FinTech

H5 There is positive relationship between the planned behavior toward the adoption of FinTech

Theoretical framework



^[25] Ajzen, I., 1991. The Theory Of Planned Behavior. Organizational Behavior and Human Decision Processes

^[26] Darmansyah, Fianto, B. A., Hendratmi, A., & Aziz, P. F. (2020). Factors determining behavioral intentions to use Islamic financial technology Three competing models. *Journal of Islamic Marketing*, 12(4), 794–812. <https://doi.org/10.1108/JIMA-12-2019-0252>

^[27] Darmansyah, Fianto, B. A., Hendratmi, A., & Aziz, P. F. (2020). Factors determining behavioral intentions to use Islamic financial technology Three competing models.

II. discussion and conclusion

In this study, the user awareness and acceptance factors toward FinTech have been determined based on the data obtained from the previous research. The study also managed to develop a conceptual framework that included the independent variables such as perceive usefulness, perceive ease of use, perceived risk, planned behavior, and mediating effect of trust of the users with the dependent variable of the consumer adoption towards FinTech products and services. Perceived usefulness has a significant effect on trust and adoption of FinTech. The result gives an impact that the user needs to be convinced of the usefulness of using FinTech to perform any transaction with financial activities. The user is looking for the convenience and benefit of FinTech products and services. The FinTech product should be able to give a superior outcome as compared to the traditional ways of performing the transaction.

The element of trust is very important to influence the users to use the services provided by the FinTech. As mention by the data provided by BNM, the users prefer to use FinTech especially concerning financial transactions. Therefore, the FinTech provider should be able to warrant the users to ensure a high level of data security and the safety of transactions performed through FinTech products and services. The user is very particular about their data security especially once they are performing any financial transactions. Perceive risk has no significant effect on the trust to adopt the FinTech products and services. Perceive risk is how the user believes the negative effect of adopting FinTech. It will give a negative impact on the trust to adopt FinTech. Normally trust and perceive risk is not interdependent. It means whenever they perceive risk increase, the trust of the users to adopt the FinTech products and services will decrease. Having a trusted user will reduce the perceived risk and influence the adoption of FinTech. Perceive risk can be in form of financial risk, legal risk, security risk, and privacy risk. These elements of risk will give a negative impact on the trust of users to adopt FinTech. FinTech service providers should be able to tackle the issues of perceived risk to gain the trust of the user to use FinTech products and services.

Several researchers have confirmed the perceived ease of use is significantly affects the adoption of FinTech among the users. The easier it is to use, the higher the trust of the consumers, thus making it easier for the users to use the products. In this study, perceived use has a positive relationship with trust and adoption of FinTech. It means the higher easefulness of the FinTech products and services, the higher the trust of the user to use the FinTech products and services. The ease of use includes the easiness to control of the FinTech products and able to use it at any convenient time without any hassle or difficulties. In addition, the FinTech products are secure to use particularly involving a financial transaction.

The above study revealed the positive relationship between planned behavior and adoption of FinTech products and services. Planned behavior is derived from the theory of Planned behavior (Ajzen, 1985, Ajzen, 1987). Planned behavior has a significant effect on the adoption of FinTech products and services. The acceptance level of the user to use

the FinTech product will increase if they believe the products will produce the desired results as they expect. In this regard, the FinTech provider needs to produce the FinTech products in line with the needs of the users.

IV. Conclusion

The objective of the study is to explore the adoption factor among the user toward the FinTech products and services. Under the era of the technology revolution, the usage of FinTech is very important, especially in the financial industry. The study was conducted by using secondary data obtaining from the previous research. It can be concluded that the provider of FinTech products and services should emphasize the importance of gaining trust from the users. Trust is a mediator between the ease of use and usefulness and the adoption of FinTech. It means if the features of the FinTech are easy to be used and provide benefits to the user but lack of trust from the users, it will not warrant the users to adopt the FinTech products and services. The element of trust has a negative relationship between perceived risk and FinTech adoption by the users. As far as the users are concerned, once the risk of FinTech is higher, the trust toward the usage of FinTech will be low. Therefore, is the FinTech provider needs to give assurance to the users the security of their data and transactions? The study had also revealed the importance of planned behavior factors to determine the adoption factors of the users toward the usage of FinTech products and services.

Planned behavior is related to the attitude of the users. In this regards the FinTech provider should emphasize the need of the users in developing the FinTech products and services. In other words, the FinTech products and services should be able to meet the objective of the users especially in terms of the benefit and easefulness of the products. Lastly, the study highlights 3 important points to the FinTech providers to gain the trust of the users to adopt the FinTech products and services. The first is to improve the efficiency of the potential users and how the services can lead to cost-saving to the user as compared with the conventional channel of doing transactions. The second is to ensure the understanding of the users and improve the user's experience of using the FinTech products and services. Thirdly is to ensure the user's data is fully secured and protected and has highly reliable cybersecurity features.

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Wireless System Design for Cryptography Algorithm for Multilingual Language

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Abstract

The increased incidents of data tampering and stealing have become a matter of concern around the globe. To prevent from such malicious activities, cryptography modules is widely used in many sectors. In this paper, a wireless cryptography algorithm prototype is developed. The design is demonstrated using Present Light weight cryptography algorithm on Basys 3 Artix 7 FPGA board. The Arm cortex M3 STM32F10C8T6 microcontroller is used to interface with Bluetooth (HC-05) module. To communicate between FPGA and controller, SPI(Serial Peripheral Interface) protocol is used and UART (Universal Asynchronous receiver-transmitter) between controller and Bluetooth module. The system design can be used for any other cryptography algorithm as well owing to reconfigurable nature of FPGA. Moreover, the design is valid for multilingual languages to encrypt and decrypt the data.

Index Terms

Bluetooth module, FPGA (Field Programmable Gate Array), PRESENT Lightweight Block Cipher, Serial Peripheral Interface (SPI), UART(Universal Asynchronous receiver-transmitter)

I. INTRODUCTION

In present scenario, attacks are not confined to physical forms but are being done on one's privacy and secret data. This private information includes Bank accounts passwords, companies' secret formula or nation confidential information. Therefore, such data ought to be protected owing to goodwill and authenticity of any firm.

Many researchers have proposed cryptography algorithm. These algorithms are classified in symmetric and asymmetric[1]such as AES[2-3], Twofish[2], DES[2], Present Lightweight algorithm[4]and etc.In case of hardware implementation of these algorithms,the area, power, memory utilization has shown remarkable results. However, not much work is being done on standalone system design of crypto algorithm.

This paper is the further extension of the previous work [4]. In this paper, Present lightweight cryptography algorithm wireless system design is demonstrated at hardware level with Basys 3 FPGA board, Arm cortex M3 STM32F103C8T6 microcontroller and HC06 Bluetooth Module. At software level, Present lightweight algorithm coding is done in VHDL language on Xilinx Vivado 2019.1 and in microcontroller; C/C++ on Arduino IDE is used. The main contribution of the paper is as follows:

- System Design works in wireless standalone mode.
- It consumes very less area, power and memory as compared to the only Present algorithm implementation.
- Proposed Design is not algorithm specific and also can be used for multilingual languages.

- It can be used for further Functionality Testing of an ASIC, replaced with Basys 3 Board.

The remainder of paper is as follows: Section 2 demonstrates the System Design Blocks. Section 3 explains the proposed design. In section 4, results and simulations are illustrated. Finally, there is conclusion and future scope.

II. SYSTEM DESIGN

The system design consists of three blocks namely, cryptography unit, interface unit and controller unit. The block diagram of the system design is shown in Figure 1. Each block is explained in detail in the following:

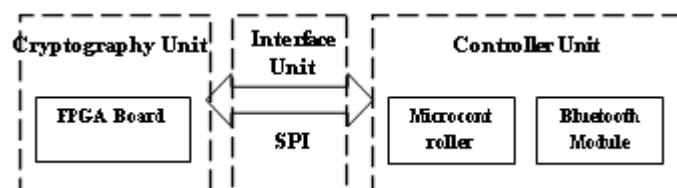


Fig. 1 Block Diagram of System Design

1 Cryptography Unit: This block has Basys 3 FPGA board shown in Figure 2. FPGA is widely used owing to its advantages such as number of input/output ports, reconfigurable, fast and efficient system. In addition to it, the code burned in FPGA is written in HDL languages which can further be used during chip manufacturing. In FPGA, Present Light weight algorithm is used. PRESENT algorithm consists of 32 rounds with 64 bits plaintext and key of 80 bits or 128 bits. The resulting output is of 64 bits. For 31 rounds, the algorithm performs the following four operations:

- Add Round Key

- S-Box
- P-Layer
- Key Scheduling

In the 32nd round, only add round key operation is performed [4].



Fig. 2 Basys 3 Board

2 Interface Unit: This unit is basically the communicating unit. SPI (Serial Peripheral Interface) protocol is used to interface between Basys 3 and controller. The SPI protocol has four pins clock, chip select, master input slave output, master output slave input[5]. SPI is used due to its synchronous nature and fast speed.

The UART (Universal Asynchronous receiver-transmitter) is used to interface HC-05 with STM32. The UART protocol has only transmit and receive pin to send data in a serial manner. It has no clock, hence it works in asynchronous manner, but it has start and stop bits around the data frame. It has parity bits to check any error[6].

3 Controller Unit: The block has two components: Microcontroller and Bluetooth module as explained below:

a) Microcontroller: The Arm Cortex M3 STM32F103C8T6 is a 32-bit medium density microcontroller as shown in Figure 3. It is advanced controller with large memories, multiple number of SPI, I2C and UART communication protocols[7]. It has high memory; fast operating speed of CPU 72Mhz. STM32 is used in printers, vehicles, solar trackers, and robots, controlling DC servo motors and sensors and many more. The STM32F103C8T6 is programmed from USB Port using FTDI (USB to Serial conversion). More about STM32 could be studied from its datasheet [7].

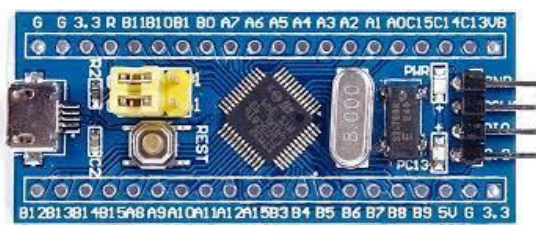


Fig. 3 STM32F103C8T6 microcontroller

b) Bluetooth (BT) Module: It is a module that uses radio waves to connect the devices in wireless mode as shown in Figure 4. Depending on the range, different Bluetooth modules are available such as HC-05, 06, 07, 08. The HC-05 has state, TX, RX, enable, VCC, ground pins and a led. The state pin is used to indicate the status of BT module. If not connected i.e. low signal led will flash continuously whereas

if connected with other device i.e. high signal, there will be alternate flashing of led that indicates module is paired. The VCC range is between 3.3V to 5V, but is powered with 3.3V as 5 V could potential damage the module. Enable depicts the valid communication in high state and no communication in low state.



Fig. 4 HC-05 Bluetooth Module

III. PROPOSED DESIGN

The proposed design is divided in three steps: Connect HC05 with phone & STM32; SPI Interface STM32 with Basys 3; Configure Present lightweight cryptography in Basys 3, which are explained in detail later in this section. The algorithm for the proposed design is as follows:

Algorithm: Wireless System Design for cryptographic algorithm using Bluetooth

Input: Text from phone keypad

Output: Bluetooth app Terminal on phone

Step I: Input: Phone $\xrightarrow{\text{Wireless mode}}$ HC-05

Step II: Data: HC05 (TX) $\xrightarrow{\text{UART}}$ STM32 (RX).

Step IV: Plaintext: STM32 (MISO) $\xrightarrow{\text{SPI}}$ Basys 3 (MOSI)

Step V: If (Key Data Load = 1) then
 MOSI \longrightarrow Input Buffer

End;

Step VI: If (Enc_Dec_Select = 1) then

Encryption is done;

Else

Decryption is done;

End;

Step VII: CipherText: Basys3 (MISO) $\xrightarrow{\text{SPI}}$ STM32 (MOSI)

Step VII: Cipher text: STM32 (TX) $\xrightarrow{\text{UART}}$ HC05 (RX)

The flow diagram is illustrated in Fig 5.

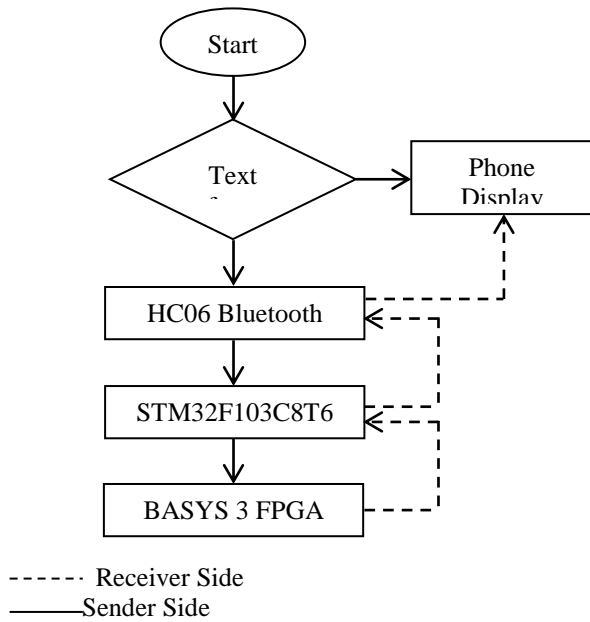


Fig. 5 Flow Diagram of proposed design

The proposed design three steps are as follows:

Step I Connect HC05 with phone & STM32: The HC05 connected with STM32, using UART communication protocol[10], UART2 pins as UART1 is connected with FTDI. The hardware connections with STM32 are shown in Figure 6. To configure BT module, initially in command mode (known as AT command) default setting like name, address, password, master/slave mode of the module is changed. To enter in command mode, press the button on module. Take out VCC wire and reinsert it, the flash rate of led on module should show delay. Then, upload the blank sketch but make sure to take out TX and RX pin connections and then make the RX,TX connections after uploading[11]. After that, in serial monitor change the Baud rate to 38400 and Both NL & CR should be selected.

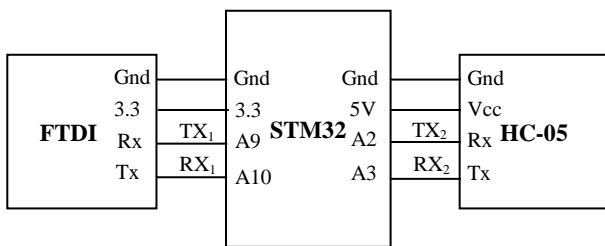


Fig. 6 Hardware connections of STM32 with HC-05

In phone, Bluetooth app should be downloaded and pair the phone with BT module. The led on module will blink slowly to show the paired state of the devices. In phone, one can select any language from phone setting keypad language; the same language will be displayed on Arduino Serial Monitor.

Step II SPI Interface STM32 with Basys 3: Through SPI interface, controller and FPGA interact with each other. For SPI hardware connections in Basys 3 are done on JA and in STM32 SPI 1 are used for connections as shown in Figure 7. In this, the STM32 act as SPI Slave and Basys 3 as SPI Master. The frequency of STM32 is 72MHz and Basys 3 is

100MHz. It followed the SPI frequency rule that SPI master frequency should be greater than or equal to twice of SPI slave. There was no need for frequency divider which might have needed in another controller like Arduino UNO.

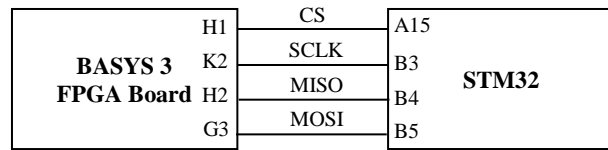


Fig. 7 SPI hardware connections between Basys 3 with STM32

Step III Configure Present lightweight cryptography in Basys 3: The STM32 microcontroller sends single bit serial data to Basys 3 through SPI pin Master out Slave in (MOSI). The total input for PRESENT algorithm [8-9] is 144 bits comprised of 64 bits plaintext and 80 bits key. With control input switch, Key_Data_Load = '1', the MOSI input bits are stored in buffer. Depending on the value of Enc_Dec_Select input switch, encryption or decryption is performed with the input data stored in the buffer. If Enc_Dec_Select is '1', then encryption is done and if Enc_Dec_Select = '0', decryption is done. After the operation is performed, the resulting data (ciphertext in case of encryption and plaintext in case of decryption) is stored in the buffer and Output_Ready flag output goes to high.

At receiver side, from Basys 3 output buffer, the data is again sent to STM 32 microcontroller serially through MISO. Then the encrypted/decrypted text is sent from STM32 UART transmit pin to Bluetooth module and is finally seen on the phone Bluetooth app terminal.

IV. RESULTS and SIMULATIONS

The system design is implemented at two levels: software and hardware. At software, one would require Vivado (Present Light weight algorithm and SPI protocol in VHDL language) and Arduino IDE (SPI and interface with HC-05). At hardware level, Basys 3 Artix 7 FPGA Board, STM32F103C8T6, FTDI and Bluetooth module HC-05 is requisite. An Android Phone with Bluetooth app download from phone play store is needed.

Initially, Software implementation of Present Lightweight cipher algorithm is done on Xilinx Vivado. As aforementioned, the serial bits from STM32 microcontroller is received by MOSI input and is stored in buffer i.e. input key for key stream and input data for plaintext. Figure 8 represents the serial bits storage in buffer with control input Key_Data_Load='1' and serial input MOSI='1'.

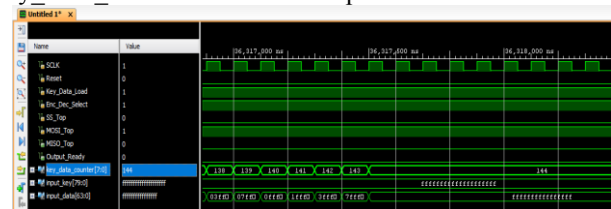


Fig. 8 Input data storage in buffer with MOSI='1'

Further, depending on the control signal Enc_Dec_Select, the encryption or decryption is performed on the stored data. Figure 9 illustrates the results obtained by setting Enc_Dec_Select = '1'. The encrypted ciphertext is stored in

buffer and sent to output pin MISO in 64 cycles depicted in Figure 9.

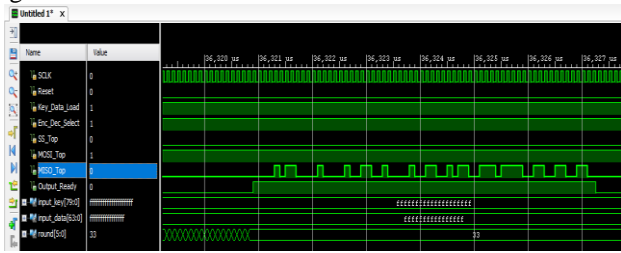


Fig. 9 Encrypted ciphertext at output pin MISO

Then, for the prototype STM32,HC-05 is soldered on the PCB with headers. FTDI is not soldered as it is needed once for programming the STM32.

The Basys 3 and STM32 is powered from Power Bank to make it portable design. Then, Plaintext input is provided from phone keypad →HC05→STM32→Basys 3 and reverse process will take place after Basys 3 perform cryptographic algorithm steps. Finally, one could see the cipher text/plaintext depend on the encryption/decryption respectively on terminal display. The system design for Hindi language is shown in Figure 10, in which first one is key and plain text of 144 bits i.e. 18 characters, entered in Hindi and then in next line on terminal cipher text of 64 bits is shown i.e. 8 characters. Similarly for English language system design is shown in Figure 11.



Fig. 10 System Design in Hindi Language

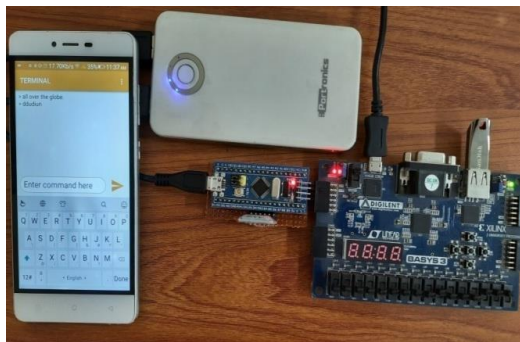


Fig. 11 System Design in English language

This system would require only 5V supply which makes it energy efficient, compact in area owing to its portability. Moreover, the SPI protocol added with Present algorithm utilizes very less slices and LUTs. Overall, this system design is user friendly especially for layman as everyone can use the

Bluetooth app on their phone without knowing internal complex functionality of cryptography algorithm.

V. CONCLUSION

The cryptography has become a necessity in every field to combat the menace of malign intruders. Therefore, portable system design for cryptography is required in such a scenario. The paper proposed a wireless system design for Present Light weight cryptographic algorithm. The SPI interface is used between Basys3 and STM32, UART between STM32 and BT module. The design is convenient to use and economical as well. It is not cryptographic algorithm and language specific design. This work can be extended by replacing the Basys 3 FPGA board by a unique cryptographic algorithm ASIC, to make the design more compact and lightweight.

Acknowledgement

The authors are grateful to Ministry of Electronics and Information Technology (MeitY) for the financial support through ‘SMDP Chip to System Design’ Project. The authors would also like to thank Director, Thapar Institute of Engineering and Technology, Patiala, Punjab, for providing necessary resources to carry out this research.

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Power, Sex and Resistance in Gordimer's *Occasion for Loving*

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Abstract

This paper examines the theme of apartheid and its resistance in Nadine Gordimer's novel *Occasion for Loving*. Through her fiction Gordimer has explored the possibility of resisting apartheid and envisioned a multiracial South Africa. She has explored in her writings the social and psychological relationships and how they are governed by race and sex. The paper argues that Gordimer has provided through her work an alternative discourse to resist apartheid. This essay discusses *Occasion for Loving* in the light of Michel Foucault. In his books, *Discipline and Punish* and *The History of Sexuality* Foucault has given an account of the significant connections between power, knowledge, and the subject, which can be used to analyse the fiction of Gordimer. He argues that power is productive and that subjects are produced through cultural and institutional practices. He mainly focuses on practices of disciplinary power which lead to binary divisions such as sane/mad, and which can be used as a means of social control. Such practices of disciplinary power are found in apartheid South Africa. Like Foucault, Gordimer seems to consider sexuality as a site of power relations governed by the dominant socio-cultural conventions. She has attempted to produce an alternative discourse about sexuality in *Occasion for Loving* and suggested a resistance to apartheid ideology of South Africa.

Key words

apartheid, Foucault, Gordimer, power, resistance, sexuality

I. Introduction

Nadine Gordimer (1923 –2014) has been a well known author who has received international attention for her imaginative records of the socio-political condition of the contemporary South Africa. With her artistic vision and unwavering social commitment, she has created a body of fiction that brought her the Nobel Prize for literature in 1991. She began her career when the National Party came to power in 1948 and institutionalized a policy of racial segregation known as apartheid. Every community or group of people considered non-European by the government was governed separately and subordinated at every level to white South Africans. Thus, for example, the Group Areas Act (1950) divided urban areas into separate blocks of black and white neighbourhoods. The Prohibition of Mixed Marriages Act (1949) and the Immorality Act (1950) made sexual and marriage relations illegal across the races (Thompson 190). The apartheid policy became more oppressive in the 1960's and 70's. On the other hand, there had been protests against the unjust and brutal policies of apartheid culminating in the election of Nelson Mandela as the president of South Africa. Gordimer was intensely alert to these developments. In fact, there is a parallel between her literary career and the rise and fall of apartheid regime. Clingman argues that history is the conditioning force of her fiction (15). And the history of South Africa in the second half of twentieth century is the history of apartheid and its resistance. This is clearly visible in Gordimer's novels such as *Occasion for Loving*.

II. Review of Literature

Gordimer has received a lot of critical attention over the years. Most of the scholars have found her work as revealing a tension between the private and the public life, or as a fictional expression of the political or historical conditions of the time. In his 1974 book, *Nadine Gordimer*, Robert F. Haugh argues that Gordimer's talent lay in her short stories where she focuses on private relationships. Haugh believes that her interest in public issues leads her to writing novels, where she tries to combine the personal with the political. John Cooke's *The Novels of Nadine Gordimer: Private Lives/ Public Landscapes* (1985) deals with the theme of dichotomy between private and public life. He approaches Gordimer's fiction from the perspectives of landscapes on which her novels revolve. Michael Wade, on the other hand, analyses the fiction of Gordimer in the political and historical contexts. In his book, *Nadine Gordimer* (1978), Wade examines the development of Gordimer's political ideas, mainly through her novels. However, Stephen Clingman's *The Novels of Nadine Gordimer: History from the Inside* (1986) is considered as the most significant study on Gordimer as a novelist and thinker. Clingman traces Gordimer's developing consciousness of history through her novels. Contextualized in the political and intellectual developments of the time, the book offers a close analysis of the novels. Clingman locates the process of historical change in the lives of Gordimer's characters and presents a view of 'history from inside'. Clingman also edited a selection of Gordimer's essays titled *The Essential Gesture: Writing, Politics and Places*. His introductions to the essays usefully

situate the essays in their historical context. Dominic Head's *Nadine Gordimer* (1994) offers a comprehensive study of the novels of Gordimer. Instead of considering only the political and historical dimension of Gordimer's fiction, he has focused on the textual politics and the craft of the author. He highlights Gordimer's complex relation to African culture and European literary form and politics of space. Judie Newman's *Nadine Gordimer* (1988) examines how the issue of gender complicates the themes of race and colonialism in the novels of Gordimer. She has shown how in Gordimer's fiction the interaction of private and public, the complex connection between psychological and political, draws upon an awareness of the relation between genre and gender. In addition to these major approaches to the fiction of Gordimer, some other scholars also have made significant contribution to the critical studies of Gordimer. Rowland Smith, Dorothy Driver, Abdul Janmohamed, Susan Gaedner, Louise Yelin, Martin Trump and Karen Lazar are most notable among them. But none of these scholars have examined the theme of resistance in the fiction of Gordimer. The present essay proposes to fill this gap. Though it often refers to the historical contexts of Gordimer's work, it focuses mainly on her response to apartheid.

III. Methodology

The present essay examines how Gordimer has treated sexuality as a tool of resistance against the apartheid regime of South Africa. The argument of the thesis is developed through a critical analysis of Gordimer's novel *Occasion for Loving* in the light of postcolonial theory as forwarded by Michel Foucault. She has explored in her writings the social and psychological relationships and how they are governed by race and sex. The paper argues that Gordimer has provided through her work an alternative discourse to resist apartheid. In his books, *Discipline and Punish* and *The History of Sexuality* Foucault has given a powerful account of the significant connections between power, knowledge, and the subject, which can be used to analyse the fiction of Gordimer. He argues that power is productive and that subjects are produced through cultural and institutional practices. He mainly focuses on practices of disciplinary power which lead to binary divisions such as sane/mad, and which can be used as a means of social control. Such practices of disciplinary power are found in apartheid South Africa. Like Foucault, Gordimer seems to consider sexuality as a site of power relations governed by the dominant socio-cultural conventions. She has attempted to produce an alternative discourse about sexuality in *Occasion for Loving* and suggested a resistance to apartheid ideology of South Africa.

Gordimer's Novel *Occasion for Loving*

In her second novel, *A World of Strangers* Gordimer explores the possibility of a multi-racial society. Her third novel, *Occasion for Loving* (1963) shows its failure as the dominant ideology to oppose segregation. Multi-racialism had been challenged since long. The African nationalists broke away from the African National Congress and founded the Pan Africanist Congress (1959) and questioned the idea of multi-racialism into question. On the other hand, the

apartheid regime was implementing its policies more strictly. Gordimer was aware of this socio-political condition of the time. *Occasion for Loving* (*OL*) acknowledges this challenge and historical realities of the time. The novel explores this issue through the theme of love and sex across colour bar, which runs through South African fiction from Plomer to Paton and beyond.

The action of the novel moves around a cross racial love affair between the black artist, Gideon Shibalo and a white woman, Ann Davis. Ann comes to South Africa with her husband, Boaz. They stay with Tom and Jessie Stilwell in Johannesburg. Tom Stilwell is a university teacher who participated in the campaign against the Extension of University Education Bill. The Bill was introduced to bar the blacks from the universities. As Thompson says, this apartheid legislation was passed in 1959 to prevent the black students from enrolling in the established universities unless a cabinet minister granted them special permission (197). In a protest meeting, an acquaintance of Tom tells him: "Fight them over this business if you want to, man, but don't think that anything you do really matters. Some of you make laws, and some of you try to change them. And you don't ask us" (*OL* 69). This shows, on the one hand, the exclusion of the blacks from the mainstream politics. On the other hand, it shows the growing suspicion of the black about the complicity of the liberal whites in the oppressive system.

Foucault argues that power is exercised in public as well as in private spheres (Ransom 28). The family is an important private sphere for the operation of power in society. In the first part of the novel, Jessie evaluates her past, her relation with her unhappily married mother. She painfully realized that she lost her youth because of her mother's confining love. Jessie's mother withdrew her from school on the pretext of a non-existent heart complaint. It left a deep scar on her mind. While watering the garden, a feeling comes to her mind that she has never left her mother's house. This is a sign of the inner struggle of Jessie to find the meaning of her past in the present situation. Both Tom and Jessie strongly believe in the sanctity of personal relationship but they ironically involve themselves in the inter-racial relationship between Ann and Gideon. However, Jessie may be said to represent Foucault's contention that public or state institutions continue the process of producing 'docile' subjects through family or individuals. Danaher et al. explain in the context of Britain that mothers were entrusted with the responsibility to perpetuate the values and attitudes of the state (Danaher 76). In South Africa, the racial differences or apartheid governed the institutions of the white family. Jessie believes that "the race business" had been settled long ago (*OL* 290). But when she comes in close touch with Ann and Gideon, she realizes how the race factor lies at the core of their life and identity. When they suddenly turn up at her family beach cottage, she discovers the effects of apartheid on her psyche. As she converses with Gideon, she gradually feels her childhood fear growing in her: "The black man that I must never be left alone with in the house. No one explained why, but it didn't matter. I used to feel, at night, when I turned my back passage and bent to wash my face in the bathroom, that someone was coming up behind me" (*OL* 290). Jessie now recognizes the racist taboos that have been inculcated in her mind by her

mother. Thus the institution of family plays an important role in the racial politics of apartheid.

Ann and Gideon were in deep love, at least for some times. They moved together, enjoyed parties. But their relation breaks down because of racial and psychological barriers. There cannot be any occasion of loving between the black and the white in the context of South Africa under apartheid. Gideon is disappointed at the racial politics in his country. He cannot go to Italy on a scholarship because the government denied him passport because of his involvement in African National Congress. So his friend Sol reacts: "Most of the whites don't want to talk to you ... *They* are the ones who decide what's going to happen to us" (original italic, *OL* 144-145). In the beginning of their relationship, Ann does not show any inhibition about race or colour. She enjoys visiting the townships and making acquaintance with the blacks. Her frank nature attracts many people to her as well. But as the narrative moves forward, she shows that she is not committed to the blacks. She does not remain faithful in her love for Gideon either. Despite her fascination for Gideon, she understands the inadequacy of their love when she runs away with him. A sense of alienation and a strange feeling comes over her during their journey to his native place. In a scene when Ann is sleeping by road, she is warned by a white African farmer of "drunk boys around on Sunday" (*OL* 268). When the man leaves, she feels a growing sense of fear in her. Ann's fear suggests that in a black majority country there is no space beyond the control of white race. And the control over space is a disciplinary practice to maintain power. The colour-blind Ann gradually becomes conscious of Gideon's colour. She tells Jessie: "You know when the man in the garage looked at Gid, and I stood next to him seeing Gid at the same time, it wasn't the same person we saw..." (*OL* 308). When they stay in the African village, Ann experiences the laws that prevent the whites and the blacks from mixing in social and public meetings in South Africa. She realizes that blackness count even in their intimate relationship. The teacher, who provides them lodging in the African village, finally tells them to leave because of fear of persecution by the apartheid regime. Realizing the realities of racial politics in South Africa, Ann decides to leave South Africa with her husband, Boaz. This is an effect of what Foucault calls disciplinary practices which produce 'docile' subjects who are afraid to transgress the social binary oppositions. In the present instance it is inter-racial sexual relationship. The end of the affair is painful for not only Gideon but Jessie as well. She feels that there is no occasion for loving between a black and a white in the racially divided society of South Africa. Apartheid pervades through every aspects of South African life, even through the most intimate relationship of man and woman. In other words, apartheid has been internalized. The love affair between Ann and Gideon fails due to external as well as internal pressure. The Immorality Act, 1950 partially accounts for the failure of their relationship. It is the effect of disciplinary practices that silently internalized the apartheid. As Clingman says, the repressions of apartheid have become "psychologically inscribed" (82). This failure makes Jessie see the futility of any attempt love to across the racial divide: "Yet even between lovers they had seen blackness count, the personal return inevitably to the social, the private to political

... So long as the law remained unchanged, nothing could bring integrity to personal relationships" (*OL* 321). Jessie painfully realizes that Ann has not been committed to her relationship with Gideon. "She did not love him *across the colour-bar...*" (original italics, *OL* 309). Ann who once claimed to be passionately in love with Gideon leaves South Africa without even bidding good bye to him. It is this attitude of arrogance of the white people to the South African blacks that Gordimer seems to criticize. Ann finally surrenders to the barriers of apartheid. The white liberal, Ann acquiescently accepts apartheid. On the other hand, her irresponsible behaviour exasperates Jessie. She cannot come to terms with the situation. She wonders how a person (Ann) falls in love with a man (Gideon) and at the same time destroys him. She reveals her feelings of annoyance and anger in a long conversation with Tom. He tries to calm her down and tells her that what else Ann could do if she didn't want him. She asks him not to make her suggest it. They do not distinguish between black and white; they behave decently to both the colours. She continues

But how can that ever be, so long as there's the possibility that you can escape back into your filthy damn whiteness? How do you know you'll always be fair?"

.....

First he couldn't get out on his scholarship because he's black, now he can't he stay because she's white. What's the good of us to him? What's the good our friendship or her love?" (*OL* 312 -13)

The above conversation reveals Jessie's painful realization of discriminatory race relations between the white and the non-white. People Gideon refuse to live according to a particular "set of circumstances" governing their life and another set governing the life of the whites. Gideon expresses his true feelings when he tells Jessie "White bitch –get away" (*OL* 331). This is a moment of confrontation and realization for Jessie. She cannot forget the words of Gideon. They open her eyes to another reality –the pain and torture of voiceless millions like Gideon Shibalo. This understanding on the part of Jessie keeps her meeting him "in a friendly fashion sometimes in the Lucky Star, occasionally at the houses of friends" though she could not understand his words (*OL* 332). These (places like Lucky Star) were the places where coloured and white people mixed opposing the apartheid ideology that segregated people into different spaces. And these borderlands are the locations of culture where new dimensions of existence emerge.

IV. Conclusion

The interracial relationship between Ann and Gideon is also an example of the idea of resistance to the racial hegemony in the apartheid South Africa. Gordimer has often shown the inter-racial relationship between white women and black men. She has been criticized for the depiction of this relationship because, as Ian Glen points out, liaisons between white men and black women were prevalent in South Africa (cited in Waxman 139). Gordimer has reversed the relationship to use it as subversive force against the traditional imbalance of power. The cross racial relation between Ann and Gideon may not be successful here but it points to possibility of such a sexual relation between the

white and the black. This is clearly visible in Gordimer's later novel, "*My Son's Story*". Through the interracial sexual relationship Gordimer has struck the very foundation of apartheid. She suggests an alternative discourse to the generally prevalent social discourse exploring the connection between sex and power. Foucault argues that the existence of state power cannot be denied but the power relations in the lives of individuals can act as resistance to power. He believes, "Power comes from the below" (*The History* 103). And he considers sexuality as a "transfer point of power". Gordimer explores the complexity of power relations among the racial groups of South Africa through her characters' personal and sexual relations. She searches for new alliances and forms and provides an alternative discourse which may act as a resistance to the apartheid regime.

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Emotional Intelligence Can Improve the Psychological Well-Being of Counseling Clients: Spiritual Intelligence and Happiness as a Mediator

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Abstract

The fact that mental health issues cannot be physically represented means that they are often ignored and rejected by the general public. Additionally, local studies put inadequate emphasis on this aspect, resulting in ambiguity regarding the level of knowledge, the function of the programs, and their effectiveness. Consequently, this study looked at the relationship between emotional intelligence, spiritual intelligence, happiness, and psychological well-being among customers of a government organization in Malaysia that provided counseling. A total of 215 counseling clients responded to the survey questionnaire. The data content of the questionnaire form was assessed psychometrically, and the research hypotheses were tested using Structural Equation Modeling (PPS) in SmartPLS to test the questionnaire form's data content. PPS research found several significant results, including the observation of a significant positive direct relationship between emotional intelligence, spiritual intelligence, happiness, and psychological well-being. Second, the indirect effect relationships between emotional intelligence, spiritual intelligence, happiness, and psychological well-being are closely related to each other in a good and significant way. The research findings suggest that spiritual intelligence and happiness are essential mediating variables in the relationship between emotional intelligence and psychological well-being. A significant recommendation derived from the findings of this study is that practitioners should be aware of the diversity of perspectives on emotional intelligence and should develop a spiritual intelligence and happiness management plan in counseling sessions to assist clients in achieving and maintaining emotional well-being in their daily lives.

Key words

Emotional intelligence, spiritual intelligence, happiness, psychological well-being

I. INTRODUCTION

Nadine In general, psychological well-being is an individual's internal or external happiness; however, its assessment varies according to knowledge, skills, and behavior. Sensitivity in the psychological well-being of an individual depends on how the person handles himself or herself wisely. The World Health Organization (WHO) sees psychological well-being as closely linked to mental illness, in second place after heart disease by 2020 (WHO, 2012; Noradilah & Mansor, 2009). This WHO statement has shown the truth when the level of psychological well-being of the community is currently on the verge of extreme concern as the whole world is dealing with Covid-19. This covid-19 crisis has increased society's risk of developing poor mental health disorders as society is faced with an abnormal social life. Mental health problems often associated with ideology and suicide attempts have reported that people with medical comorbidities are more likely to increase depressive

symptoms because treatment is limited during the covid-19 pandemic (Wong et al., 2021).

Even the mental health of the unemployed and those with financial problems is worse than those affected by the covid-19 epidemic (OECD, 2021).

A study published in the Public Health reported that the crisis in Malaysia has caused many individuals to experience extreme anxiety. In Malaysia, this trend of anxiety and depression has become more pronounced since the government established movement control orders (MCOs) over a long time requiring individuals to isolate themselves from social activities, loss a source of income, and exposure to unhealthy family environments (Shanmugam et al., 2020; Yusof, 2021). This trend has indirectly increased domestic violence and marital problems, and an increase in suicide rates and disproportionate levels of stress have been reported in the local media (Abdullah 2020; Dorall 2020; Togoh 2020). Among the 855 mental health support hotline calls operated by a particular government body for COVID-19 in

2021, most mentioned experiencing severe financial, relationship, and mental health problems (Aziz et al. 2020; Hassan 2020; Malay Mail 2021).

Meanwhile, COVID-19 preventive measures for public health, such as individual need physical distancing, quarantine, and isolation, can exacerbate mental symptoms as they deal with loneliness and trauma (Wikipedia, 2021). Reports have found that social isolation and loneliness are associated with anxiety, depression, suicide attempts, and self-harm (Athira, 2020). Other risks include alcohol and drug abuse, domestic and child abuse, feelings of burden with loss, and relationship damage. The results showed that 35.33% of university students had anxiety symptoms, and 72.93% had symptoms of depression (Villani et al., 2021). A sample of Italian students from the Università Cattolica del Sacro Cuore, a campus in another Italian province with different faculties, has shown a link between gender and anxiety and confirmed that women tend to have more anxiety symptoms than men when responding to medical emergencies and being quarantined (Villani et al. 2021).

These data are consistent with previous studies, showing that young people, especially university students, are at higher risk of mental health problems (Villani et al., 2021). This study examines how university students in Malaysia overcome the psychological effects of the COVID-19 pandemic and restrictions movement (known as MCO) (Kamilah et al. 2020). His research focuses on general discourse in mainstream media and social media related to public health issues, migration, and violence. Some students are also involved with Universiti Malaya's social outreach initiatives to offer solutions to the mental health challenges faced by Malaysian during the COVID-19 pandemic (Caring Together/UMPrihatin), focusing specifically on the social media platforms of Telegram and Facebook (Gerard et al. 2021). Although 89 countries in the survey reported that mental health and psychosocial support were part of their national response plans to COVID 19, only 17 countries had total or additional funds to cover these services (WHO, 2021). Seeing this significant upward trend requires the concern of stakeholders to take proactive measures (e.g., expanding counseling services) to prevent this bad behavior from spreading and hindering community development.

II. LITERATURE REVIEW

Direct effect relationship between Emotional Intelligence, Spiritual Intelligence, happiness, and psychological well-being

The theory of emotional intelligence pioneered by Daniel Goleman highlights that emotional intelligence is very relevant and necessary in the way of life of an individual. Consistent with the meaning of emotional intelligent, which focuses on a person's ability to control the feelings and emotions of oneself and others and lead all their actions and thoughts rationally (Salovey and Mayer 1990). Salovey and Mayer divide emotional intelligent into four aspects: identifying emotions, using emotions, understanding emotions, and managing emotions, while Goleman (1998) categorizes EQ into five dimensions, namely self-awareness, self-regulation, motivation, empathy, and social skills.

However, recent studies have found that emotional intelligence has been developed using two main aspects (i.e., personal competence and social competence) and focusing on six main elements (Sandhya & Namrata, 2013).

The six elements of personal and social skills are self-awareness, self-motivation, emotional regulation, social awareness, social skills, and emotional receptivity—self-awareness, which refers to the ability to see oneself objectively. Self-awareness involves interactions between thoughts and feelings aware of a person's positive and negative emotions in a particular situation or circumstances. Self-motivation is the ability to do what needs to be done without influencing other people or situations. Self-motivated people can find reason and strength to complete tasks, even in challenging situations and circumstances, without giving up or needing others to push them. Emotional regulation is the ability to observe and control one's emotions. This is the ability to respond to a variety of emotions in a socially acceptable way. It emphasizes being flexible to justify spontaneous reactions as well as the ability to delay spontaneous reactions.

On the other hand, social awareness refers to the ability to see, understand, and respond to the emotions of others and feel socially comfortable. It involves knowing about others regarding feelings, thought patterns, points of view, achievements, facial expressions, and non-verbal messages. Social skills are the ability to communicate, persuade, and interact with other members of society, without undue conflict or disharmony. It is the ability to express positive and negative feelings in an interpersonal context. Social skills consider the art of persuasion and the ability to create a friendly atmosphere in the workplace. It also emphasizes dealing with difficult people and annoying situations wisely. Emotional acceptance refers to accepting and encouraging the point of view of others by being open to their emotions. Good emotional acceptance makes a person emotionally and socially competent. Furthermore, it makes the individual empathetic to the needs of others. In general, emotional intelligence is a person's ability to manage and control his or her feelings and those of others while providing positive impetus toward establishing human relationships that can lead to achieving a goal (Cooper & Sawaf 1997; McGarvey 1997).

The recommendations put forward by the theory are supported by empirical studies that have been carried out by researchers, namely Joanna Samul (2020), who studied 190 students of the University of Technology in Poland. Ardhiyana et al. (2019) studied 217 cadets at Surabaya Polytechnic. A study by Jale and Meltem (2020) used 217 university students, among them 94 males and 123 females, aged between 19 and 25 years from various departments of Uludag University in Turkey, found that self-resilience is a reinforcer of the relationship between emotional intelligence and well-being. A study by Sanchez-Ruiz et al. (2021) using 360 individuals between the ages of 18 to 69 in Lebanon found that the nature of emotional intelligence can deal with stressful situations such as pandemics positively at both cognitive levels by re-formulating situations to see something valuable in them, and behavioral levels, by being proactive about it.

A study by Joan et al. (2019) used 646 students in years one, second, third, and fourth of Secondary Education, most of whom were aged between 12 and 17 years in eight schools in the Community of Extremadura (Spain) at random. In this line, some researchers state that emotional repair is fundamental to proper psychological functioning and mental health. Adolescents with higher levels of emotional improvement tend to engage in pleasurable disruptive activities, contributing to greater feelings of happiness. A study by Ansari et al. (2019) involving 210 mothers and children with special needs in the city of Bojnourd in 2019 showed a positive and significant relationship between spiritual intelligence and marital satisfaction with psychological well-being ($p < 0.01$). Spiritual intelligence and marital satisfaction predicted 46% of the difference in the mother's concerned psychological well-being, and marital satisfaction has a more significant contribution to the psychosocial well-being of mothers with children with special needs. A study by Fateme et al. (2020) involving 541 nurses from Shiraz nursing students and Tehran University of Medical Sciences showed that students with higher levels of spiritual intelligence had a significant impact on mental health. This is because the mental health performance of students can consider solutions to improve the spiritual intelligence and personal life of university students. These studies show that emotional intelligence, spiritual intelligence, happiness, and psychological well-being are interrelated and reinforce each other. Spiritual Intelligence and Emotional Intelligence are two concepts in health psychology that play a significant role in determining many things. Spiritual intelligence uses customizable spiritual intelligent (SI) to help people solve problems and achieve their daily goals. Emotional intelligence (EI) is the ability to recognize, evaluate, and control the emotions of a person, others, and the collective (Aghamohammadi & Asgari, 2016), and even this effect can indirectly increase the happiness and psychological well-being of each individual.

Hypothesis 1: Emotional Intelligence has a positive and significant relationship with spiritual intelligence.

Hypothesis 2: Emotional Intelligence has a positive and significant relationship with psychological well-being.

Hypothesis 3: Emotional Intelligence has a positive and significant relationship with Happiness.

Hypothesis 4: Spiritual intelligence has a positive and significant relationship with psychological well-being.

Hypothesis 5: Spiritual intelligence has a positive and significant relationship with happiness.

Hypothesis 6: Happiness has a positive and significant relationship with psychological well-being

The relationship of indirect effect between Emotional intelligence, Spiritual Intelligence, happiness with Psychological Well-being

Furthermore, the role of spiritual intelligence and happiness as mediating variables in improving emotional intelligence and psychological well-being is said to solve daily life problems. Hasan (2009) has said that spiritual intelligence is an attitude of self-awareness about our relationship with God,

each other, and all beings. However, it depends on one's ability to see things better from the individual aspect and recognize the relationship between perception, faith, and attitude. This is in line with the theory of Spiritual Intelligence introduced by Emmons (1999), which proposes five components for spiritual intelligence: first, the ability to use spiritual resources to solve problems; second, the ability to enter situations causing increased awareness; third, the ability to carry out social activities daily with a sense of holiness, fourth, the ability to transcend the physical and material, and fifth the ability to be virtuous (Emmons, 2000a). According to Kraut (1979), happiness is a long-term state characterized by subjective well-being, not the temporary positive mood we experience over time. Lung, Ying-Mei & Mei-Yen (2009), in turn, look at happiness from two different angles, namely hedonism and eudaimonism. Hedonism is said to be that happiness lies in success or satisfaction that is successfully fulfilled, while eudaimonism argues that true happiness is rooted in identifying one's virtues, nurturing them, and living according to them. This shows that one's self-personality plays a vital role in enhancing one's happiness. Indirectly, the influence of spiritual intelligence and happiness also has a significant impact on emotional intelligent and psychological well-being because it is seen that they are all interconnected and have a strong relationship with each other.

Although the relationship of the direct effect model has been extensively studied, based on the limitations of previous studies, there have been only three studies concerning the indirect effect model involving spiritual intelligence and happiness as mediating variables. For example, a study conducted by Abdalla and Ahmed (2018) showed that spiritual intelligence as a mediating variable explains the relationship between stress coping strategies and well-being. Whereas a study by Said et al. (2020) found that the mediating role of spiritual intelligence in the relationship between perfection and life expectancy among administrators of Azad Islam University, Mazandaran, Iran has an indirect effect on life expectancy. While the study conducted by Yuni et al. (2021) involving 126 lecturers in one of Indonesia's best universities confirmed that happiness should be used as a mediating variable because happiness is essential to improve the work performance of lecturers in the university. If a person feels less happy, they are more likely to feel sad, anxious, empty, hopeless, worthless, guilty, irritable, or anxious. According to Sharif et al. (2012), happiness in the individual dramatically influences health. Happier individuals contribute to motivation and productivity and maintain intrapersonal, interpersonal, and social relationships (Aziz et al., 2014). These studies show that people with high spiritual intelligence and happiness are more likely to have better mental abilities in understanding situations and responding to the tensions and pressures of the internal and external environment. At the same time, they can manage feelings and emotions when faced with problems and immediately take steps to cope with stress in daily life. Thus, high spiritual intelligence and happiness can improve a person's quality of life and personal and social success and is an essential factor in determining life success and psychological well-being.

In conclusion, previous studies had limitations in studying spiritual intelligence and happiness as mediating variables when previous studies used moderate correlations to measure the strength of the relationship between dependent and independent variables. In addition, previous studies used a simple interview method to explain different respondents' perceptions of emotional intelligence, happiness, spiritual intelligence in society, let alone can be used to identify the effectiveness of counseling sessions conducted during the covid -19 outbreak. Thus, this study was conducted to guide counselors, educators, and organizational leaders on the importance of their role in improving psychological well-being. Therefore, this leads to the following hypothesis:

Hypothesis 7: Spiritual intelligence as a mediating variable has a positive and significant relationship with emotional intelligence and psychological well-being.

Hypothesis 8: Happiness as a mediating variable has a positive and significant relationship with spiritual intelligence and psychological well-being.

intelligence, and psychological well-being. So it is evident here that the lack of past studies indicates significant evidence of a relationship between emotional intelligence, spiritual intelligence, happiness versus psychological well-being. This prompts researchers to fill in the gaps and at the same time want to prove that this relationship is significant and should be given due attention

Hypothesis 9: Spiritual intelligence and happiness as mediating variables have a positive and significant relationship with emotional intelligence and psychological well-being.

Hypothesis 10: Spiritual intelligence as a mediating variable has a positive and significant relationship with emotional intelligence and happiness.

The research literature has guided the researchers to formulate a conceptual framework for this research, as illustrated in Figure 1.

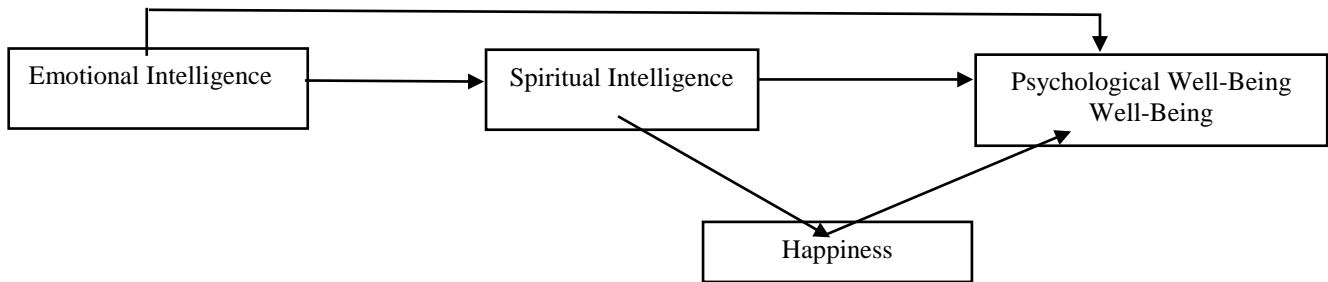


Figure 1. Conceptual Framework

III. METHOD AND STUDY AREA

Research Design

This study was conducted in one of Malaysia's counseling agencies. The institution's name cannot be released following the organization's confidentiality policy. In general, this institution has developed several initiatives to assist the government in fulfilling its mandate and obligations to enhance the family institution to build a quality Malaysian population. A current concern at this institution is the disparity between community well-being and the competence of the professional counselors required by the community and industry. Efforts to address this issue have resulted in developing family counseling programs, Nur@home programs, clinical services, mammogram subsidy programs, and community programs as effective instruments for improving the community's psychological well-being and preparing them to meet life's emotional, spiritual, and conscious needs.

The agency offered autonomy for distinction and oversaw the distribution of questionnaire forms supporting the study's vision, mission, and purpose. These questionnaires were distributed in various ways and were distinguished by time,

function, and resource. Counselors, for example, will send this questionnaire to clients who have finished therapy sessions, group sessions or are enrolled in counseling programs.

As Sekaran and Bougie (2016) proposed, this study employs survey methods and a cross-sectional research design to assist researchers in collecting accurate data, minimizing bias, and enhancing the quality of data gathered. During the initial rounds of data collecting, questionnaires based on the literature on emotional intelligence, spiritual intelligence, happiness, and psychological well-being were created. Additionally, the technique of back-to-back translation is utilized to translate the questionnaire survey into English and Malay, thereby enhancing the quality of the study findings (Lomand, 2016).

Research Sample

This study employed a stratified sample technique intending to distribute 250 questionnaires to counseling clients. This study adopted this selection strategy since agency management did not disclose extensive information about counseling clients regarding confidentiality. Due to this constraint, researchers cannot employ random sampling procedures to recruit participants for this study. Counselors

handed out questionnaires to all respondents who sought counseling services. The counselor's assistance is critical in assisting the researcher in obtaining data accurately and speedily, as the evaluator is familiar with the respondent's condition and progress.

Additionally, these therapy clients responded anonymously and voluntarily to the survey form with their approval. 215 (86 percent) of the total questionnaires were returned to the researchers as useable. As indicated by Podsakoff et al. (2003), the Harman single factor test was employed to ascertain the bias introduced by the survey approach. The results indicated that the proportion of variance was 41, which was less than the 50% variance (Podsakoff et al. 2003), indicating that the survey method was not biased.

Research Instruments and Procedures

This study's questionnaire consisted of four major sections: firstly, emotional intelligence is measured using 12 items derived from Sandhya and Namrata's work (2013). Second, spiritual intelligence is measured using five items from Abdollahzadeh et al.'s (2009) study. Thirdly, happiness is measured using five items derived from the Hills and Argyle (2002) study. Fourth, psychological well-being, as measured by four measures modified from Ryff's 1989 study. The items were rated using a five-point Likert scale ranging from (1) "strongly disagree" to (5) "strongly agree." As this study investigated the feelings of counseling clients, demographic factors such as gender, age, place of residence, religion, citizenship, higher education, occupation, marital status, and monthly income were used.

Data Analysis

SmartPLS was used to analyze survey questionnaire data to generate latent variable scores, address small sample numbers and aberrant data, and evaluate complex research frameworks (Hair, Hult, Ringle, & Sarstedt, 2016; Henseler, Ringle, & Sinkovics, 2009). The following procedures were used to analyze the data: firstly, validation factor analysis was done to determine the measuring scale's reliability and validity. Second, the direct effect model was examined, and a

significant hypothesis was defined as one with a t-statistic greater than 1.65 (one-tailed test) (Henseler et al., 2009). Third, we examined the indirect impact model, and a significant hypothesis was defined as one with a t-statistic greater than 1.96 (two-tailed test) (Henseler et al., 2009). Fourth, the R2 value was employed as a criterion for the model's overall predictive strength based on the following baseline values: 0.19 (weak), 0.33 (moderate), and 0.67 (big) (Hair et al., 2017; Henseler et al., 2009). Fifth, using the value of f2 as a guide, the effect size of the predictive variable in the model was determined using the following rules: 0.02 (weak), 0.15 (moderate), and 0.35 (big) (Hair et al., 2017). Sixth, the Q2 value was used to determine forecast appropriateness using the following criteria: 0.020 (weak), 0.15 (moderate), and 0.35 (very strong) (large). Seventh, the standard root mean residual value (SRMR) was less than 0.1, used as a criterion for model appropriateness (Hair, Hult, Ringle & Sarstedt, 2016). Finally, the mediation effect is determined using the approach described by Zhao, Lynch, and Chen (2010) and Hair et al. (2017) to determine if the model has a partial, complete, or no mediation impact.

IV. RESULTS AND DISCUSSION

According to Hair et al. (2017), survey questionnaire data must be filtered before analyzing measurement models and structural equation models. According to this guideline, questionnaires with no missing values were employed, and items with suspicious responses, Skewness, and Kurtosis values more than +/- 2.0 were eliminated from this questionnaire. This study used only questionnaires that met the criteria for validity and reliability analysis.

Characteristics of respondents

According to Table 1, the majority of respondents are female (68.4 percent), aged between 25 and 40 years (45.1 percent), live in the city (57.2 percent), are Muslims (93.5 percent), ethnic Malays (93.5 percent), have a degree (53.0 percent), are self-employed (45.6 percent), are married (54.4 percent), and have an income of less than RM1999 (53.0 percent).

Table 1: Demographics

Characteristics	Category	Frequency	Percentage
Gender	Male	68	31.6
	Female	147	68.4
Age	Below 25	90	41.9
	25- 40	97	45.1
	41- 56	28	13.0
Residence	Town	123	57.2
	Rural	92	42.8
Religion	Muslim	201	93.5
	Non-muslim	14	6.5
Nation	Malay	201	93.5
	Cina	5	2.3
	India	1	0.5
	Others	8	3.7
Education	LCE/SRP/PMR	2	0.9
	MCE/SPM/SPMV	24	11.2
	HSC/STPM/STAM	4	1.9

	Sijil/Diploma	55	25.6
	Ijazah	114	53.0
	Others	16	7.4
Employment	Government	85	39.5
	Private	32	14.9
	Self-employed	98	45.6
Marital status	Married	117	54.4
	Single	90	41.9
	Others	8	3.7
Income	< 1999	114	53.0
	2k – 2999	34	15.8
	3k – 3999	16	7.4
	4k - 4999	20	9.3
	5k - 5999	14	6.5
	>6k	17	7.9

Note: SPM/MCE (Sijil Pelajaran Malaysia/Malaysia Certificate of Education)
 STPM/HSC (Sijil Tinggi Pelajaran Malaysia/Higher School Certificate)PMR/SRP/
 LCE (Penilaian Menengah Rendah/Sijil Rendah Pelajaran/Lower School Certificate).

Reflective measurement model (Outer Model)

Three tests will be used in this reflective measurement analysis: convergent validity, internal consistency reliability, and discriminant validity. The results of this test are used to determine whether the model created using constructs and indicators is reliable and valid. Internal consistency in measuring constructs is measured using composite reliability values. The outer loading and AVE values were used to determine how well the indicators connected with other indicators in the same construct. In discriminant validity

analysis, the value of HTMT refers to the ratio of the correlation inside a construct to the correlation between constructs.

According to table 2, all convergent validity values match the criteria established by Hair et al. (2017), namely that the outer loading value exceeds 0.708, the reliability indicator value, and the AVE value approach at least 0.50. In terms of internal consistency dependability, the defective CR value exceeds 0.708.

Table 2: The value of the reflective measurement model

Indicator	Convergent Validity			Internal Consistency Reliability
	Outer Loadings	Indicator Reliability (>0.50)	AVE (>0.50)	Composite Reliability
B01	0.723	0.523	0.569	0.940
B06	0.713	0.508		
B14	0.722	0.521		
B18	0.739	0.546		
B19	0.832	0.692		
B20	0.814	0.663		
B25	0.753	0.567		
B31	0.805	0.648		
B32	0.789	0.622		
B40	0.720	0.518		
B41	0.708	0.501		
B54	0.714	0.509		
C04	0.868	0.753	0.731	0.931
C05	0.878	0.771		
C15	0.865	0.748		
C16	0.897	0.805		
C28	0.762	0.581		
D03	0.813	0.661	0.763	0.928
D07	0.847	0.717		
D12	0.836	0.698		
D17	0.772	0.596		

D18	0.722	0.521		
E30	0.826	0.682	0.639	0.898
E33	0.888	0.786		
E36	0.863	0.745		
E37	0.914	0.835		

Source: Questionnaire

Table 3 displays the concept validity and reliability outcomes. All HTMT values for each construct were less than 0.90 (Hair et al., 2017; Henseler et al., 2009), and all personal interval values for each construct listed in

parenthesis were less than 1 (Hair et al., 2009). This means that the notion satisfies the criteria of discriminatory analysis.

Table 3: Discriminatory Analysis Results

Construct	Emotional Intelligent	Spiritual Intelligent	Psychological well-being	Happiness
Emotional Intelligent	0.754			
Spiritual Intelligent	0.654 (0.546, 0.759)	0.855		
Psychological well-being	0.761 (0.351, 0.627)	0.604 (0.005, 0.250)	0.873	
Happiness	0.713	0.599 (0.513, 0.685)	0.689 (0.092, 0.433)	0.799

Note. The values in the parenthesis are the values of confidential interval at 5% and 95%.

Construct Analysis

Table 4 displays the variance inflation factor and descriptive data. According to these findings, the mean values for all variables ranged from 4.000 to 4.437, indicating that some respondents perceived their degree of emotional intelligence, spiritual intelligence, psychological well-being, and happiness to be between (4) and (7). However, the

variance inflation factor for the relationship between the independent variable (i.e., emotional intelligence) and the mediating variable (i.e., spiritual intelligence and happiness) and the dependent variable (i.e., psychological well-being) is less than 5.0, indicating that the data do not have significant collinearity issues (Hair et al., 2017).

Table 4. Analysis of variance inflation factor and descriptive statistics

Construct	Mean	Standard Deviation	Variance Inflation Factor		
			Spiritual Intelligent	Psychological well-being	Happiness
Emotional Intelligent	4.054	0.598	1.000	2.432	
Spiritual Intelligent	4.437	0.653		1.865	1.000
Psychological well-being	4.010	0.699			
Happiness	4.000	0.766		2.170	

Structural Measurement Model (Inner Model)

Hypothesis result for the direct effects model

The hypothesis outcomes for the direct effect model are shown in Table 5. According to the findings of this study, EI accounted for 42.5 percent of the changes in SI. This suggests that other factors outside this study's subject explained up to 57.5 percent of the SI variance. This model has a moderate effect if the R2 value is larger than 0.33. Furthermore, SI, H, and EI explained 62.6 percent of the change in PWB. This suggests that other factors that were not the focus of this study account for 37.4 percent of the PWB variance. Meanwhile, SI and EI accounted for 35.9 percent of the H

variation, suggesting that other factors outside this study's focus explained 64.1 percent of the H variance. Following that, the results of the study hypothesis test revealed six significant findings: First, EI is substantially linked with SI (B = 0.654; t = 12.098), supporting H1. Second, EI was linked with PWB (B = 0.676; t = 14.001), supporting H2. Third, EI was shown to be substantially linked with H (B = 0.392; t = 7.249), lending credence to H3.

Fourth, SI was shown to be substantially linked with PWB (B = 0.282; t = 4.532), lending credence to H4. Fifth, SI was substantially linked with H (B = 0.599; t = 13.711), supporting H5. Sixth, H had a strong correlation with PWB (B = 0.265; t = 3.063), supporting H6.

Following that, we evaluated the effect magnitude (f^2), model fit (SRMR value), and forecast relevance (Q2). The association between EI and SI showed an f^2 value larger than 0.35 (Hair et al., 2017), indicating that it had a significant influence. The link between EI and PWB has a value of f^2 (0.269) less than 0.35, indicating a modest effect. The association between EI and H has a value of f^2 larger than 0.35, indicating a significant effect. The association between SI and PWB has a value of f^2 (0.282) less than 0.35,

indicating a modest effect. The link between SI and H has a value of f^2 larger than 0.35, indicating a significant effect. The link between H and PWB has a value of f^2 (0.265) less than 0.35, indicating a modest effect. The standard root means residual value (SRMR) for this model is 0.092, less than 0.1, indicating that it is suitable. SI has a Q2 value of 0.299, PWB has a value of 0.470, and H has 0.208, which are more significant than zero, showing that the model makes meaningful predictions.

Table 5: Results of direct effect model structural measurement analysis

Hypothesis	Relationship	β	P	t	Result	R ²	F ²	Q ²	SRMR
H1	EI → SI	0.654	0.000	12.098	Accepted	0.425	0.748	0.299	0.092
H2	EI → PWB	0.676	0.000	14.001	Accepted	0.626	0.269	0.470	
H3	EI → H	0.392	0.000	7.249	Accepted	0.359	0.392	0.208	
H4	SI → PWB	0.282	0.000	4.532	Accepted		0.282		
H5	SI → H	0.599	0.000	13.711	Accepted		0.599		
H6	H → PWB	0.265	0.002	3.063	Accepted		0.265		

Note. Significant at * $t > 1.67$ (one tail testing); EI: Emotional Intelligent; SI: Spiritual Intelligent; H: Happiness; PWB: Psychological well-being

Hypothesis result for the indirect effects model

The indirect effect model's hypothesis outcomes are shown in Table 5. This research indicated that EI and SI accounted for 42.8 percent of the variation in PWB. This suggests that up to 57.2 percent of the variance in PWB was explained by factors other than those examined in this study. This model has a significant influence if the R2 value is greater than 0.33. Additionally, SI and H accounted for 63.1 percent of the change in PWB. This suggests that 36.9 percent of the variance in PWB was explained by factors other than those examined in this study.

Meanwhile, EI, SI, and H explained 78.7 percent of the variation in PWB, which suggests that 21.3 percent of the variance in PWB was explained by factors other than those examined in this study. Finally, EI and Si explained 35.9 percent of the H variation, implying that 64.1 percent of the H variance was explained by factors other than those examined in this study. Following that, the study hypothesis test revealed four significant findings: firstly, EI was shown to be substantially linked with SI and PWB ($B = 0.081$; $t = 1.973$), corroborating H7. Second, SI was strongly linked with H and PWB ($B = 0.159$; $t = 3.067$), implying that H8 is supported. Third, EI was shown to be substantially linked with SI, H, and PWB ($B = 0.104$; $t = 2.780$), implying that H9 is correct.

Fourth, EI was strongly linked with SI and H ($B = 0.392$; $t = 7.249$), implying that H10 is correct.

Following that, we evaluated the effect magnitude (f^2), model fit (SRMR value), and forecast relevance (Q2). The association between EI, SI, and PWB showed an f^2 value greater than 0.35 (Hair et al., 2017), indicating significant influence. The association between SI, H, and PWB has a value of f^2 (0.110) less than 0.15, indicating a modest effect. The association between EI, SI, H, and PWB has a value of f^2 larger than 0.35, indicating a significant effect. The association between EI, SI, and H has a value of f^2 larger than 0.35, indicating a significant effect. The standard root means residual value (SRMR) for this model is 0.092, less than 0.1, indicating that it is suitable. EI has a Q2 value of 0.489, SI has a value of 0.589, PWB has a value of 0.589, and H has a value of 0.456, all of which are more significant than zero, showing that the model makes meaningful predictions. Using that, a test was undertaken to determine the mediator's effect, following the procedures described by Zhao, Lynch, and Chen (2010) and Hair et al. (2017). The data confirm that the study model's mediating variable is a positive mediator effect. This demonstrates that spiritual intelligence and happiness can function independently of emotional intelligence and psychological well-being in the interaction.

Table 6: Results of the measurement analysis of the indirect effect model structural model

Hypothesis	Relationship	β	P	t	Result	R ²	F ²	Q ²	SRMR
H7	EI → SI → PWB	0.081	0.000	1.973	Accepted	0.428	1.017	0.489	0.092
H8	SI → H → PWB	0.159	0.000	3.067	Accepted	0.631	0.110	0.589	
H9	EI → SI → H → PWB	0.104	0.000	2.780	Accepted	0.787	1.396	0.589	
H10	EI → SI → H	0.392	0.000	7.249	Accepted	0.359	0.560	0.456	

Note. Significant at * $t > 1.96$ (two tail testing); EI: Emotional Intelligent; SI: Spiritual Intelligent; H: Happiness; PWB: Psychological well-being

V. DISCUSSION AND CONCLUSION

Numerous previous studies have extensively used direct impact models to examine the relationship between emotional intelligence and spiritual intelligence (Joanna

Samul, 2020; Ardhiana et al., 2019), spiritual intelligence, and psychological well-being (Melley, Getrude & Stephencie, 2019; Fereshtel et al. 2019), spiritual intelligence and happiness (Sakinah et al. 2020; Marzieh, 2019), and spiritual intelligence and happiness (Sakinah et al. 2020;

Marzie (Zohreh & Alireza, 2016; Shama, Shamin & Farzana, 2016). The test results for such a model show the degree of correlation between the variables. However, most studies cannot quantify the effects of spiritual intelligence and happiness as important mediating factors on emotional intelligence and psychological well-being. This situation encourages researchers to contribute to the body of knowledge by investigating the mediating effects of spiritual intelligence and happiness on the relationship between emotional intelligence and psychological well-being. Based on the available literature, this research aims to create a conceptual framework for emotional intelligence, spiritual intelligence, happiness, and psychological well-being. Spiritual intelligence and happiness are important mediating factors in structural models' relationship between emotional intelligence and psychological well-being. These results imply that counselors' ability to integrate spiritual intelligence and happiness into counseling sessions, formal or informal coaching, may impact the client's emotional intelligence effectiveness. As a consequence, this condition may aid them in developing the psychological well-being required for everyday functioning.

The Board of Counselors has widely defined the role of counselors in this research given worldwide challenges in addressing a range of human problems in various situations (e.g., family, work, education, rehabilitation, community, etc.). Later, the ministry delegated power to entities (e.g., schools, institutions, public, commercial, community, business, and non-governmental organizations (NGOs)) that counsel all individuals and communities. Community counseling agencies are empowered by responsible centers, primarily the Social Welfare Department and LPPKN, to provide comprehensive assistance services to individuals, families, and communities. These services include intervention tactics and services to promote the well-being of individuals, families, and communities. The counselor-client connection is essential because it contributes to determining whether coaching goals are fulfilled in the community. The overwhelming majority of respondents said they lacked emotional intelligence, spiritual intelligence, happiness, and psychological well-being. This example shows how a counselor's ability to promote comfortable discussion and provide vital support during counseling can help clients improve their emotional intelligence. Consequently, the spiritual intelligence, happiness, and psychological well-being of each person may be enhanced.

This study has significant theoretical and practical consequences. In terms of theoretical contribution, this study's results show that spiritual intelligence and happiness positively impact counseling clients' emotional intelligence and psychological well-being. These results are consistent with Bar-On's (2006) emotional intelligent model, which maintains that emotional intelligence results from the interdependence of emotional and social competence. These ideas are thought to significantly impact how we comprehend and express ourselves, how we comprehend and express others, how we connect to others, and how we deal with everyday emotional problems. Following that, Gardner's theory of many bits of intelligence establishes that spiritual intelligence meets the requirements for a modality of

autonomous intelligence. Emmons (2000a) believes that adaptive use of spiritual knowledge may assist individuals in resolving daily problems and achieving particular life objectives. While Cristina (2019) suggested that three main components should be addressed when assessing happiness: positive emotions, participation, and meaning. Contentment occurs when positive feelings such as pleasure, comfort, and happiness are present. These feelings may describe a stage of life characterized by many pleasant events (Seligman, 2002, 2004).

Additionally, happiness is described as a person's ability to fully participate in activities considered pleasant and capable of showcasing one's unique abilities. At the same time, happiness has been linked to the search for a greater purpose in life. When these three components work in unison, genuine and consistent pleasure results (Vella-Brodrick, Park, & Peterson, 2009). Thus, to achieve genuine pleasure, each individual must prioritize their strengths above their flaws. The three pillars of positive psychology are positive emotions, positive traits, and positive institutions, all of which seek to increase life satisfaction (Seligman, 2002). The function of spiritual intelligence and client happiness may help to improve emotional intelligence and psychological well-being. The theories are backed up by research conducted by Joanna Samul (2020), Ardhiana et al. (2019), Getrude and Stephencie (2019), Md. Aftab, AAhad, and Muhammad Sabbir (2018), Najib et al. (2017), and Faramarzi and Hassanzadeh (2017) discovered that counselors' ability to practice emotional intelligence is contingent on the diverse personalities, needs, and expectations of clients in formal analytic settings. Consequently, its efficacy may assist customers at any counseling service agency increase their spiritual intelligence, happiness, and psychological well-being.

Additionally, practitioners may utilize the results of this research to improve the effectiveness of guidance and counseling management in organizations that provide counseling services. To achieve this objective, management should consider the following: to begin; therapy sessions should place a premium on problem avoidance to help the client develop his or her internal resources. To prevent the client from acquiring mental illness, this inner strength must be fostered via courage, optimism, interpersonal skills, spirituality, work ethic, hope, honesty, perseverance, and a desire to live. Aristotelians actively advocate for this stage to establish the client's well-being via positive psychology, positive preventative measures, and positive therapy (Idat et al., 2020). Second, counseling sessions are necessary to conduct an in-depth analysis of the client's self to determine the client's level of self-strength, life quality, hope circle, the current state of well-being, and positive orientation (Idat et al. 2020). This inquiry requires the counselor to help the client develop self-acceptance and a new perspective of life, whether positive, negative, or adaptive, by examining each incident. On the other side, counselors are responsible for educating clients about the long-term implications of their excellent or destructive behaviors. This awareness shows how to develop self-improvement abilities and evaluate the client's life experience with purpose, optimism, and direction.

Additionally, the counselor should encourage the client to collect all of their positive and negative childhood memories and convert them into meaningful experiences in order to aid the client in creating a positive interpretation of their childhood experiences. Following that, positive orientation techniques are necessary for the treatment session to assist the client in gaining strength, good emotions, and a higher sense of importance and fulfillment. The therapist may use this technique to persuade the client that although not everyone will have a mental illness, they are all entitled to their pleasure. Counseling sessions that emphasize positive emotions have increased a person's happiness, resilience, and well-being. Seligman (2002) supports this claim by saying that clients may attain well-being if they have positive emotions about their history, present, and future. Thirdly, communities and non-governmental organizations (NGOs) developing strong growing relationships between counselors and clients, and increasing client motivation). Socio-emotional motivation may assist clients in adapting more successfully, improving their chances of success and psychological well-being. These improvements aid the client in attaining a higher level of psychological well-being. Additionally, this concept may be used to re-energize the client by urging them to create a good sentiment counseling program of negative emotions into positive ones, thus enabling them to behave in life's purpose.

Additionally, there are recommendations for addressing the study's methodological and conceptual shortcomings. Firstly, future research should focus on specific critical customer factors such as age, gender, marital status, profession, income, and level of education. This may help us better understand the impact of various client characteristics on counseling sessions at various agencies. Second, longitudinal studies should be examined because they may reveal trends in variables over time, offer valuable information about personal changes, and evaluate the strength and type of connections between variables. Third, further study should be conducted to understand better the intermediary impacts of spiritual intelligence and happiness on counseling sessions in different Malaysian agencies. Fourth, more theoretical concepts related to spiritual intelligence and happiness must be researched and published in order for them to be generally acknowledged as a critical connection between emotional intelligence and psychological well-being. Finally, probability sampling design, particularly stratified random sampling, should be explored since it will gather data at random, thus reducing the bias associated with the conventional approach. The significance of the suggestions stated before should be explored further in future research.

Numerous methodological and conceptual constraints were found throughout this study. First, this research has used a cross-sectional research design, which prevents causal inference between variables. Second, this research neglects to test the relationship between the mediating and dependent variables' specific dimensions. Third, this study only used client perceptions as a measure to assess the relationships between variables in the hypothesized model. Fourth, this study was performed only in a Malaysian counseling service organization. Finally, the sampling strategy should be incapable of circumventing response bias. The constraints

should plan at least three annual formal assemblies. This session is essential in helping the client utilize his intellect to distinguish between truth and error, contemplate the presence of nature and the power of Allah SWT, and balance his evil and good aspirations. This technique has been proven to significantly enhance people's personalities, morale, and confidence, enabling them to resume their everyday lives. Fourth, peer mentoring programs should begin by recruiting high-performing clients to serve as group leaders. They may share success stories and motivate and train group members to best help other customers' emotional, spiritual, and psychological well-being. Finally, special counseling programs for low-performers should be established to reinforce cognitive behaviors (e.g., cultivating clients' positive beliefs and expectations about achieving life goals,

listed above may restrict the ability of this study's findings to be generalized to other agencies.

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Can Physical Activity and Emotional Intelligence Control Psychological Well-Being of Counseling Clients in Malaysia during the Covid-19: Spiritual Intelligence as a Mediator

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Abstract

The spread of the Covid-19 affects the community as well as individuals in dealing with daily lifestyle. Regular physical activity is beneficial for health, motor skill development, psychosocial well-being and cognitive development. The situation of covid 19 is getting worse as the percentage of physical activity, emotional problems increase, and society is facing various mental issues. Therefore, this study was conducted to evaluate the differences between physical activity with emotional intelligence, spiritual intelligence and psychological well-being, besides this study investigate the relationship between emotional intelligence (personal and social) and spiritual intelligence among counseling clients in one of the counseling agencies in Malaysia. A total of 87 counseling clients answered the questionnaire. SmartPLS analysis was used to psychometrically evaluate the data content of the questionnaire form and test the research hypotheses. The analysis results are expected to yield some significant findings: First, there is significant differences between physical activity and psychological wellbeing. Second, there is a positive and significant relationship between emotional (personal) intelligence and spiritually intelligent. Third, there is a positive and significant relationship between emotional (social) intelligence and spiritually intelligent. Fourth, there is a positive and significant relationship between spiritually intelligent and psychological well-being. Fifth, there is a positive and significant relationship between emotional (personal and social) intelligence, spiritually intelligent and psychological well-being. This study confirms that personal and social emotional intelligence is an essential variable for building spiritual intelligence and psychological well-being. Furthermore, the findings of this study can be used as essential recommendations to help practitioners understand the diversity of perspectives on the construction of emotional intelligence and serve as a guide in counseling sessions to help achieve and maintain their emotional well-being in daily life

Key words

Counseling, Emotional intelligence, Physical Activity, Psychological well-being, Spiritual intelligence, SmartPLS.

I. INTRODUCTION

The achievements of the economy, science, technology, politics and education in Malaysia are at a very commendable level and are expected to continue to grow in line with current developments in the world. To sustain this development, the Malaysian government has formulated the Vision for Shared Prosperity 2030 with a more comprehensive goal of improving the living standards of Malaysians to a more comfortable level by 2030. The essence of this formulation will implement several measures to minimize risk and drive the economy by increasing economic opportunities, strengthening human capital, ensuring inclusivity as well as

improving public institutions and finances [1]. Although the living standards of the people are expected to improve, by the end of 2019 Malaysia has been sensationalized with the Covid-19 epidemic which has threatened many lives around the world. This continuous increase in positive cases of covid-19 has forced the implementation of the movement control order (MCO) from 18 March 2020 until phase-3 (mid-2021). The spread of the epidemic has a major impact on various segments of society including in terms of physical activities, loss of income and employment, limiting social and community activities, cut off basic food needs for poor families and rural people or in the interior and increased workload faced. by front -line officers. Regular physical activity will support the person as well as battle a variety of

physical and mental health diseases [2] 61.4% have been reported by the World Health Organization in context to physical activity and the Malaysian population who aged 15 years and above were physically inactive, hence placing Malaysia in the top ten most physically inactive countries in Asian. According to the National Health and Morbidity Survey 2019, students make up 39% which is the second highest number of people who are physically inactive in our country. According to World Health Organization 2020, a physically inactive lifestyle is dangerous to be lived because it can affect one's well-being and psychological behavior.

Physically inactive will negatively affect health and contribute to excessive weight gain. Therefore, to encourage involvement in physical activities, personal and social emotional is very important to motivate an individual to perform physical activities. To maximize such effectiveness, spiritual intelligence is an important indicator of physical activity and needs to be clearly identified as examples of social and psychological well-being [3]. This condition disrupts the mental and emotional well-being of some of them which can cause these individuals to experience stress, depression, anxiety, bipolar disorder and schizophrenia [4], it will affect their lifestyle. In general, psychological well-being is the happiness of an individual either internally or externally, yet its assessment varies according to knowledge, skills and behavior. Ryff (1989) has presented several elements contained in this model namely autonomy, environmental control, self-development, positive relationships with others, life goals and also self-acceptance. These elements serve as a measure of an individual's psychological well-being against existing strengths and weaknesses. In fact, these elements are the basis for the construction of the needs of the Psychological Well-Being Index among the people and civil servants in Malaysia. Although the basis of this formation is made a measurement as a whole but the sensitivity in the psychological well-being of an individual depends on how they handle themselves wisely. The World Health Organization (WHO) sees psychological well-being to be closely linked to mental illness which is said to be in second place after heart disease by 2020 [6].

Based on the (WHO 2020), 1 out of 4 adults in Malaysia is physically inactive. From the survey we know that the physically inactive among adults in Malaysia are those aged 75 years and above which make up 59%, the second is students which make up 39% followed by females which is 28% and urban dwellers which make up 27%. This shows that students are the second most less active physically in Malaysia. This fact is frightening because the numbers of diseases that are linked with lifestyle keep increasing in our country, especially diabetes which 1 in 5 adults in Malaysia have diabetes and hypertension which 3 in 10 people in Malaysia have hypertension or mental health illness. The increase in those suffering from mental illness is significant and this statement is supported when the National Health and Morbidity Survey Report shows statistics about 40 percent of 32.4 million Malaysians are feared to have mental health [7] and a total of 18,336 individuals out of 273,203 individuals

who receiving health care in hospitals and clinics are reported to suffer from mental health disorders such as depression, schizophrenia and suicidal tendencies [8]. This statistic is strengthened when the Talian Kasih Report published by the Ministry of Women, Family and Community Development (KPWKM) has also recorded a record increase in the number of people seeking counseling services which jumped to 47.3 percent during MCO Phase I was enforced. The service recorded 336 complaints on physical, mental, emotional and sexual abuse as well as exploitation and neglect of children, domestic violence, people with disabilities (OKU) and the elderly.

While the symptoms of suicide in Malaysia are also at an alarming level and need to be addressed immediately. During 2021, an increase of 631 cases was reported compared to 2020 of 609 cases [9]. This report is further strengthened when the WHO (2017) has recorded an estimated average suicide case of 3,000 with an estimate of more than 20 attempted suicide cases per day. This expectation is supported when the President of the Malaysian Psychiatric Association (APA), Professor Nor Zuraida Zainal said that more than 2,000 Malaysians die by suicide and an average of seven suicides occur a day or around 200 a month or seven people out of 100,000 people in the country are determined to suicide [9]. For data collection, the National Suicide Registry Center of Malaysia says that at least two people commit suicide every day with an average rate of 60 people in a period of a month [10].

These data show that we desperately need a clear yardstick to look at the issue of psychological well-being among the people. Although the selected data show that there is a need to develop an index of psychological well-being, but do the people feel there is a need in creating such an index? Do they know the relationship of this psychological well-being to the happiness of their lives and the individuals among them? These are some of the scopes that need to be looked at on this study as a whole. If society or the government fails to manage this stressful situation, it will weaken the immune system and disrupt the ability of the individual body to cope with infections and diseases while inviting psychological problems. Therefore, efforts to curb this psychological disorder at the micro level must be implemented immediately and effectively.

Although many previous studies have examined the influence of emotional intelligence in improving psychological well-being, most of these studies have focused on emphasizing the characteristics of emotional intelligence and the direct effects between variables. In conclusion, previous studies have limitations in the aspect of studying spiritual intelligence as a mediating variable, previous studies used simple correlations to measure the strength of the relationship between dependent and independent variables, previous studies used simple interview methods in explaining different respondents' perceptions of intelligence. emotional, spiritual intelligence and psychological well-being. It is clear here, that the lack of past studies indicates a significant difference of physical activity with emotional intelligence, spiritual

intelligence and psychological well-being. Besides, weakness of evidence of a relationship between emotional intelligence, spiritual intelligence versus psychological well-being. This prompts researchers to fill in the gaps and at the same time want to prove that this relationship is very important and should be given due attention in society let alone can be used to identify the effectiveness of counseling sessions conducted during covid -19 outbreak. Thus, this study was conducted to provide guidance to counselors, educators and organizational leaders on the importance of their role in improving psychological well -being.

Physical activity with psychological well-being

People who committed with their work and responsibility, as busy as they get, they have less time to engage in doing physical activity. People's motivation towards physical activity thus there is no driven force that will make them engage into physical activity [11]. This results in making them less active and making their unhealthy. This goes the same with university students in which they tend to get caught with their assignments, projects, study and even homework's making them having less time and motivation to do physical activity. Psychological well-being and emotional intelligence play an important role in making people engage in physical activity. Without emotional intelligence and spiritual intelligence, people will not have the desire to engage in physical activity because they do not see the benefits or the outcomes that they can get or achieve from participating in physical activity [12]. This will make them unmotivated thus they are not engaged in physical activity because it is not their priority and this leads to an inactive physical activity lifestyle.

The Relationship of Emotional Intelligence with Spiritual Intelligence

The role of emotional intelligence in changing human behavior is in line with the theoretical proposal introduced by Daniel Goleman through his famous book "Emotional Intelligence" which uses Salovey and Major's model to see how EQ relates to lifestyle. Thus, EQ can be formulated as a person's ability to control the feelings and emotions of oneself and others as well as being able to lead all their actions and thoughts rationally [13]. Salovey and Mayer divide EQ into 4 aspects namely identifying emotions, using emotions, understanding emotions and managing emotions while [14] categorizes EQ into five dimensions namely self-awareness, self-regulation, motivation, empathy and social skills. Yet recent studies have found that emotional intelligence has been developed using 2 main aspects (i.e.; personal competence and social competence) and focusing on six main elements [15]. Among the six elements contained in personal and social skills are self-awareness, self-motivation, emotional regulation, social awareness, social skills and emotional receptivity. This study focuses on three elements. First, self -awareness which refers to the ability to see oneself in objective terms. Self -awareness involves interactions between thoughts and feelings that are aware of a person's positive and negative emotions in a particular situation or circumstances. Second, social awareness refers to the ability

to see, understand and respond to the emotions of others and feel socially comfortable. It involves knowing about others in terms of feelings, thought patterns, points of view, achievements, facial expressions and non -verbal messages. Third, emotional acceptance refers to accepting and encouraging the point of view of others by being open to their emotions. Good emotional acceptance makes a person emotionally and socially competent. Furthermore, it makes the individual empathetic and sensitive to the needs of others. In general, EQ is a person's ability to manage and control his or her feelings and those of others while providing positive impetus toward establishing human relationships that can lead to an achievement of a goal [16].

The recommendations put forward by the theory are supported by empirical studies that have been carried out by researchers namely [17] who studied 190 students of the University of Technology in Poland; [18] studied 217 cadets at Surabaya Polytechnic; [8] studied 250 students from various higher education in Malaysia and Maryam and [19] studied 354 students in the 2014-2015 academic session at Zabol University. These studies show that emotional intelligence and spiritual intelligence are interrelated and reinforce each other. Spiritual intelligence can develop intrapersonal and interpersonal competencies which are components of emotional intelligence that are closely related to good attitudes such as humility, forgiveness and gratitude. Therefore, this leads to the following hypothesis:

Hypothesis 1: Emotional personalities have a positive and significant relationship with spiritual intelligence.

Hypothesis 2: Social emotional has a positive and significant relationship with spiritual intelligence.

The Relationship of Spiritual Intelligence with Psychological Well -Being

Furthermore, it is found that the role of spiritual intelligence in improving psychological well-being which uses a set of abilities and competencies in solving problems of daily life in line with the theory of Spiritual Intelligence introduced by [20]. This theory reveals that spiritual intelligence is a framework for identifying the skills and abilities required for adaptive spiritual use. [20] proposed five components to spiritual intelligence: first, the ability to use spiritual resources to solve problems, second, the ability to enter situations causing awareness to increase, third, the ability to carry out daily social activities with a sense of holiness, fourth, the ability to transcend physical and material, and the fifth ability to be virtuous.

Several studies have recognized that spiritual intelligence is a significant antecedent of psychological well -being. For example a study by [21] that reviewed 255 members of the Christian Emmanuel Fellowship; [22] studied 220 Mazandaran University students; [19] studied 90 women i.e. breast cancer patients who received treatment and attended hospital counseling sessions; [23] studied 205 participants from various religious denominations recruited from various religious institutions for spiritual encounters; [24] studied 202 married and unmarried women; [25] studied 123 gifted

female high school students in [26] studied 112 employees of metal manufacturing companies in Slovenia; and [27] studied 253 secondary school teachers in Mahshahr city. These studies show that people with high emotional intelligence are more likely to have better mental abilities in understanding situations and responding to the tensions and pressures of the internal and external environment. At the same time, they are able to manage feelings and emotions when faced with problems and immediately take steps to cope with stress in daily life. Thus, high emotional intelligence can improve a person's quality of life and personal and social success and is an important factor in determining life success and psychological well-being. Therefore, this leads to the following hypothesis:

Hypothesis 3: Spiritual intelligence has a positive and significant relationship with psychological well-being.

The relationship of emotional intelligence, spiritual intelligence and psychological well-being

Although the relationship of the direct effect model has been extensively studied but based on the limitations of previous studies, to date there have been only two studies with respect to the indirect effect model involving spiritual intelligence as a mediating variable. For example, a study conducted by [28] showed that spiritual intelligence as a mediating variable explains the relationship between stress coping strategies and well-being. Whereas a study by [29] found that the mediating role of spiritual intelligence in the relationship between perfection and life expectancy among administrators of Azad Islam University, Mazandaran, Iran has an indirect effect on life expectancy. Furthermore, about 56% of the variance of spiritual intelligence and 25% of the variance of life expectancy are explained by perfectionism and about 88% of the variance of life expectancy is justified by spiritual intelligence. This percentage indicates that the importance of spiritual intelligence as a mediating variable to see the influence among other variables. Therefore, this leads to the following hypothesis:

Hypothesis 4: Spiritual intelligence as a mediating variable has a positive and significant relationship with personal emotional and psychological well-being.

Hypothesis 5: Spiritual intelligence as a mediating variable has a positive and significant relationship with social emotional and psychological well-being.

Although many previous studies have examined the influence of emotional intelligence in improving psychological well-being, most of these studies have focused on emphasizing the characteristics of emotional intelligence and the direct effects between variables. In conclusion, previous studies have limitations in the aspect of studying spiritual intelligence as a mediating variable, previous studies used simple correlations to measure the strength of the relationship between dependent and independent variables, previous studies used simple interview methods in explaining different respondents' perceptions of intelligence. emotional, spiritual intelligence and psychological well-being. So, it is clear

here, that the lack of past studies indicates a significant weakness of evidence of a relationship between emotional intelligence, spiritual intelligence versus psychological well-being. This prompts researchers to fill in the gaps and at the same time want to prove that this relationship is very important and should be given due attention in society let alone can be used to identify the effectiveness of counseling sessions conducted during covid-19 outbreak. Thus, this study was conducted to provide guidance to counselors, educators and organizational leaders on the importance of their role in improving psychological well-being.

The research literature has guided the researchers to formulate a conceptual framework for this research, as illustrated in Figure 1.

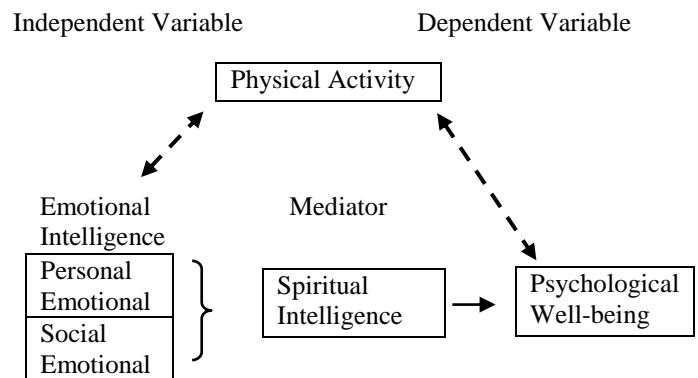


Figure 1. Conceptual Framework

II. Method and study area

A. Research Design

This study was conducted in one of the government agencies that offer counseling services in the State of Pahang, Malaysia. The name of this institution is not displayed on the basis of confidentiality. The institution has planned various strategies to overcome physical and psychological problems involving individuals, families and communities. In the context of this study, the agency was given autonomy to plan and administer the distribution of questionnaires to support the vision, mission and purpose of this study. The distribution of these questionnaires was taken from various forms and differentiated by time period, function and source. For example, counselors will distribute this questionnaire to clients who have completed counseling sessions, during group sessions and clients who are involved in the guidance program.

This study uses survey methods and cross-sectional research design to help researchers collect accurate data, reduce bias, and improve the quality of the data collected [30]. In the early stages of data collection, questionnaires were compiled based on the literature on physical activity, emotional intelligence, spiritual intelligence and psychological well-being. Further, back-to-back translation techniques were used to translate the survey questionnaires into English and Malay to improve the quality of research results [31].

B. Research Sample

This study uses a sampling method to distribute 100 questionnaires to counseling clients in one of the government agencies that offer counseling services in the State of Pahang, Malaysia. For the purpose of this study, this sampling technique was chosen because agency management did not provide detailed information about counseling clients on confidentiality. This limitation does not allow researchers to use random sampling techniques in selecting participants for this study. Counselors distributed questionnaires to all respondents who came to seek counseling services. The help of this counselor is important to help the researcher obtain data accurately and promptly because the evaluator knows the condition and development of the respondent. Further, these counseling clients answered the survey questionnaire anonymously and voluntarily, based on their consent. Of the total, 87 (87%) usable questionnaires were returned to the researchers.

C. Research Instruments and Procedures

There are 2 questionnaires for this study which is International Physical Activity Questionnaire (IPAQ) to indicate the physical activity among the client, which pertain to the amount of time spent in vigorous physical activity, moderate physical activity, walking, and sitting over the last seven days. This questionnaire has a test reliability that indicated good stability with high reliability ($\alpha < 0.80$) [32]. Next, psychological well-being questionnaire, this questionnaire included four main sections: First, emotional intelligence using 10 items adapted from the study of [15]. This construct is assessed using two elements: personal and social emotional. Second, spiritual intelligence using 6 items adapted from the study of [33]. Third, psychological well-being using 5 items adapted from [5] study. A 5-point Likert scale ranging from (1) “strongly disagree” to (5) “strongly agree” was used to rate the items. Demographic variables such as gender, age, place of residence, religion, citizenship, higher education, occupation, marital status and monthly income as this study assessed the emotions of counseling clients.

D. Data analysis

The IPAQ questionnaire, used Statistical Package for Social Sciences (SPSS) version 26 to evaluate the data gathered. All variables provide descriptive statistics in the form of frequencies, means \pm standard deviation ($\bar{x} \pm SD$). The variables used in this study are a healthy lifestyle and amount of physical activity. Additionally, the study applied T-test testing, to indicate the significant differences of physical activity with emotional intelligence, spiritual intelligent and psychological well-being. Survey questionnaire data were analyzed using SmartPLS for providing latent variable scores, addressing small sample sizes, abnormal data, and evaluating complex research frameworks [34], [35]. The data analysis procedures were: First, validation factor analysis was used to assess the reliability and validity of the measurement scale. Second, the direct effect model was tested, and a significant hypothesis was identified if the t-statistic value was more than 1.65 (one-tailed test) [35]. Third, the indirect effect model was tested, and a significant hypothesis was recognized if the t-statistic value was more than 1.96 (two-tailed test) [35]. Fourth, the R2 value was used as the overall predictive strength criterion of the model based

on the following baseline: 0.19 (weak), 0.33 (moderate), and 0.67 (large) [34], [35]. Fifth, the value of f2 was used as a guide to determine the effect size of the predictive variable in the model based on the following rules: 0.02 (weak), 0.15 (moderate), and 0.35 (large) [34]. Sixth, the Q2 value was used as a measure of forecast suitability based on the following criteria: 0.020 (weak), 0.15 (moderate), and 0.35 (large). Finally, the standard root mean residual value (SRMR) was lower than 0.1 and was applied as a model suitability criterion [34], [36].

III. Results and discussion

According to [34], survey questionnaire data must be filtered first before being used to analyze measurement models and structural equation models. Based on this recommendation, questionnaires with no missing value were used and items with suspicious answers, Skewness and Kurtosis values greater than +/- 2.0 were removed from this questionnaire. Only questionnaires that met the validity and reliability analysis criteria were used in this study.

A. Characteristics of respondents

Table 1 shows that the majority of respondents are female (69%), aged between 25 to 40 years (48.3%), live in the city (64.4%), the majority are Muslim (93.1%), Malay (95.4%), education level Certificate/Diploma (35.6%), working in the government sector (55.2%), married (50.6%) and earning below RM1999 (44.8%).

Table 1: Demografi

Characteristics	Category	Frequency	Percentage
Gender	Male	27	31.0
	Female	60	69.0
Age	Below 25	31	35.6
	25- 40	42	48.3
	41- 56	14	16.1
Residence	Urban	56	64.4
	Rural	31	35.6
Religious	Muslim	81	93.1
	Non-muslim	6	6.9
Ethnic	Malay	83	95.4
	Cina	1	1.1
	India	3	3.4
Education	LCE/SRP/PMR	2	2.3
	MCE/SPM/SPMV	19	21.8
	HSC/STPM/STAM	2	2.3
	Sijil/Diploma	31	35.6
	Ijazah	27	31.0
Employment	Lain-lain	6	6.9
	Kerajaan	48	55.2
	Swasta	7	8.0
Status	Bekerja sendiri	32	36.8
	Berkahwin	44	50.6
	Bujang	38	43.7
Income	Lain-lain	5	5.7
	< 1999	39	44.8
	2k – 2999	24	27.6
	3k – 3999	6	6.9

4k - 4999	10	11.5	C08	0.797	0.703	0.635	0.934
5k - 5999	3	3.4	C09	0.900		0.810	
>6k	5	5.7	C11	0.833		0.694	
Note: SPM/MCE (Sijil Pelajaran Malaysia/Malaysia Certificate of Education)			C12	0.848		0.719	
STPM/HSC (Sijil Tinggi Pelajaran Malaysia/Higher School Certificate)			C21	0.762		0.581	
PMR/SRP/LCE (Penilaian Menengah Rendah/Sijil Rendah Pelajaran/Lower School Certificate).			C22	0.881		0.776	
			E02	0.769	0.703	0.591	0.925
			E08	0.836		0.699	
			E33	0.828		0.686	
			E37	0.929		0.863	
			E39	0.852		0.726	

B. Differences physical activity with PE, SE, SI and PWB

Based on the table 2, for the Levene’s test, the p- value is .0.0001 which was statistically significant (p<.05), which less than 0.05. The Mean item that use to generate activity summary score that was statistically significantly different with personal emotional, social emotional, spiritual emotional and psychological well-being. As the result has been significant, we used the “Equal variances assumed” output. T-test for Equality of Means provides the results for the actual Independent Samples t Test.

Table 2: Differences of physical activity with PE, SE, SI and PWB

	Mean difference	p
Physical Activity	21.89655	0.000
Personal Emotional	3.89655	0.000
Social Emotional	3.75402	0.000
Spiritual Emotional	4.47510	0.000
Psychological Well-being	3.85287	0.000

C. Reflective measurement model

Based on table 3 shows that all outer loading values recorded values as recommended by [34] which is above the value of 0.708. Convergent validity is seen in the value recorded by AVE which must reach at least 0.5. For internal consistency reliability, the defective CR value is > 0.708.

Table 3: The value of the reflective measurement model

Indicator	Convergent Validity		Indicator Reliability	Internal Consistency Reliability
	Outer Loadings	AVE (>0.50)		
B25	0.748	0.638	0.559	0.898
B26	0.821		0.674	
B27	0.756		0.572	
B28	0.855		0.731	
B32	0.809		0.654	
B41	0.816	0.687	0.666	0.916
B47	0.808		0.653	
B53	0.879		0.773	
B54	0.859		0.738	
B60	0.779		0.607	

Source: Questionnaire

Note. The values in the parenthesis are the values of confidential interval at 5% and 95%.

D. Construct Analysis

Table 4 shows the analysis of variance inflation factor and descriptive statistics. These results found that the mean values for all constructs were in the range between 4.25 to 6.50. In contrast, the value of the variance inflation factor for the Table 3 shows the results of construct validity and reliability. The value of the Heterotrait-monotrait correlation ratio (HTMT) for each construct is less than 0.90 [34],[35] indicating that the construct has met the discrimination validity criteria [34],[35]. The secret interval value for each construct shown in parentheses falls below 1 [34], indicating that the construct has met the standards of discriminant analysis.

Table 4: Discriminatory Analysis Results

Construct	Psychological well-being	Personal Emotional	Social Emotional
Personal Emotional	0.888		
Social Emotional	0.748	0.890	
Spiritual Intelligence	0.732 (0.643, 0.738)	0.818 (0.277, 0.604)	0.823 (0.204, 0.552)

relationship between the independent variable (i.e., self awareness, social awareness and emotional receptivity) and the mediating variable (i.e., spiritual intelligence), and the dependent variable (i.e., psychological well-being) was lower than 5.0, indicating that the data do not have serious collinearity problems [34].

Table 5. Analysis of variance inflation factor and descriptive statistics

Construct	Mean	Standard Deviation	Variance Factor	Inflation
Personal	3.896	0.65048	3.527	Spiritual Intelligence Psychological well-being

Emotional	6		
Social	3.754	0.62558	3.527
Emotional	0		
Spiritual	4.475	0.67940	1.000
Intelligence	1		
Psychoogic al	3.852	0.62092	
well-being	9		

Structural Model Measurement

Table 5 shows that 62.5 percent of the changes in SI are explained by PE and SE for the direct effect model. This means that as much as 37.5 percent of the SI variance was explained by other factors that were not the focus of this study. This R2 value greater than 0.33 indicates that this model has a large effect. For the indirect effect model, 48.4 percent of the PWB variance was explained by PE, SE and SI. This means that as much as 51.6 percent of the PWB variance is explained by other factors that are not the focus of this study. A value of R2 greater than 0.33 indicates that this model has a large effect. Next, the findings of the study hypothesis test showed five important findings: First, PE was significantly correlated with SI (B = 0.452; t = 3.552); therefore, supporting H1. Second, SE correlated with SI (B = 0.371; t = 2.737); thus, supporting H2. Third, SI was significantly correlated with PWB (B = 0.695; t = 18.815); thus, supporting H3. Fourth, PE and SI correlated significantly with PWB (B = 0.258; t = 2.725); thus, supporting H4. Fifth, SE and SI correlated significantly with PWB (B = 0.314; t = 3.387), thus, supporting H5.

Next, effect size (f2), model fit (SRMR value) and forecast relevance (Q2) were tested. The f2 value for the relationship between PE and SI (0.154) was lower than 0.15 [34], indicating that it had a moderate effect. The value of f2 for the relationship between SE and SI (0.104) is lower than 0.15, indicating that it has a moderate effect. The value of f2 for the relationship between PE, SE, SI and PWB (0.936) is greater than 0.35, indicating that it has a large effect. The standard root mean residual value (SRMR) is 0.097, which is lower than 0.1, indicating that this model is appropriate. The Q2 value for SI is 0.320 and PWB is 0.410, which is higher than zero, indicating that the model has a relevant forecast.

Table 6: Results of structural model measurement analysis

Hypothesis	Relationship	β	t	Result
H1	PE → SI	0.452	3.55	Accepted
H2	SE → SI	0.371	2.74	Accepted
H3	SI → PWB	0.695	18.82	Accepted
H4	PE → SI → PWB	0.258	2.73	Accepted
H5	SE → SI → PWB	0.314	3.39	Accepted

Note. Significant at * t >1.96 (two tail testing); Self_A: Self-Awareness; Social_A: Social Awareness; ER: Emotional Receptivity; SI: Spiritual Intelligence; PWB: Psychological well-being

IV. Conclusion

Being physically active can provide many health benefits to those who partake and having an inactive physical lifestyle can have detrimental outcomes on his or her health. Being physically active can give a healthy body and also a healthy mindset which good in their psychological well-being. This will increase the quality of life. Young adults also get caught up with urbanization and also their commitment making them not having enough time or spiritual intelligent and emotional intelligent to engage in physical activity. According to the self-determination theory people are motivated to grow and change by three innate and universal psychological needs which are emotional intelligence, spiritual intelligence and psychological well-being [37].

Many past studies have extensively used direct impact models to investigate the relationship between emotional intelligence (self-awareness, social awareness and emotional receptivity) and spiritual intelligence [17],[18], [28], [37]. The test results of such a model only determine the strength of the correlation between the variables. However, most researchers are unable to measure impact measures and spiritual intelligence as significant mediating variables between emotional intelligence (i.e.: self-awareness, social awareness and emotional receptivity) and psychological well-being. This situation inspires researchers to expand the literature by evaluating the intermediate effects of spiritual intelligence in the relationship between emotional intelligence (i.e.: self-awareness, social awareness and emotional receptivity) and psychological well-being. This study forms a conceptual framework based on emotional intelligence, spiritual intelligence and psychological well-being literature. Structural models have shown that spiritual intelligence acts as a significant mediating variable in the relationship between emotional intelligence (i.e.: self-awareness, social awareness and emotional receptivity) and psychological well-being. These findings indicate that the ability of counselors in applying the importance of spiritual intelligence in the activities of counseling sessions, formal and / or informal guidance can drive the effectiveness of the client's emotional intelligence. As a result, this condition can enhance the development of their psychological well-being to go about their daily lives.

In the context of this study, the role of counselors has been broadly defined by the Board of Counselors based on global challenges to address various human problems in various situations (e.g. family, work, education, rehabilitation, community etc.). Later, the ministry has given autonomy to agencies (e.g. schools, institutions, public sector, private sector, community, industry and non-governmental organizations (NGOs)) that offer counseling services to enhance the personal development and well-being of all individuals and communities. In community counseling agencies, the responsible centers, particularly the Social Welfare Department and LPPKN, are empowered to provide comprehensive assistance services involving intervention strategies and services to improve the well-being of individuals, families and communities. The interaction between the counselor and the client is very important

because they are able to determine the achievement of the coaching objectives in the community. The majority of participants indicated that the levels of emotional intelligence, spiritual intelligence and psychological well-being were low. This situation explains that the ability of the counselor to implement comfortable communication and provide adequate support in the counseling session will increase the spiritual intelligence in the client. As a result, emotional intelligence and psychological well-being can be improved in each client.

This study provides two important impacts: theoretical contributions and practical contributions. Regarding the theoretical contribution, the results of this study confirm that spiritual intelligence has influenced the emotional intelligence and psychological well-being of counseling clients. These results are consistent with understanding [38], [39]. [38] intelligent emotional model argues that emotional intelligence involves interrelated relationships of emotional and social competence. These theories are thought to tend to determine how we understand and express ourselves, how we understand others, how we relate to the people around us, and how we cope with daily emotional challenges. Whereas Gardner's theory of multiple intelligences finds that spiritual intelligence meets the criteria for an independent intelligence modality. This view is supported by [39], who states that the adaptive use of spiritual information can facilitate the solution of everyday problems and achieve certain goals in life. As a result, emotional intelligence and psychological well-being can be enhanced through the role of the client's spiritual intelligence. The theories are supported by the study of [17], [18], [40], [28], [33] who revealed that the ability of counselors to practice emotional intelligence is based on the diverse personalities, needs, and expectations of clients in formal and informal counseling activities have improved their spiritual intelligence. Therefore, this effectiveness can improve the psychological well-being of clients in each counseling service agency.

Furthermore, in terms of practical contribution, the results of this study can be used by practitioners to improve the effectiveness of guidance and counseling management in counseling service agencies. To achieve this goal, management should pay attention to the following aspects: First, creative training programs should be precisely designed to help clients use standard content and methods in the application of practices to everyday life with different needs and expectations. This practice can make it easier for counselors to measure their clients' abilities in achieving guidance and counseling goals. Second, responsible centers in schools, universities, the public sector, the private sector, communities and NGOs should plan formal assembly sessions at least three times a year. This session is important to guide the client so that he can use his intellect to distinguish between truth and error, think about the existence of nature and the power of Allah SWT and balance the evil desires of the evil desires with the good desires. This practice can improve the personality, morale, and confidence of the clients to continue their lives like normal human beings. Third, peer mentoring programs should begin by highlighting

high-performing clients to become group leaders. They are directly able to share success stories, motivate and guide group members to support the emotional, spiritual and psychological well-being of other clients. Fourth, special counseling programs for low-performing clients should be arranged to reinforce cognitive behaviors (e.g. fostering clients' positive beliefs and expectations about realizing life goals, creating strong growing relationships between counselors and clients, and increasing client motivation. Socio-motivational aspects. this can improve client adaptation, increase success, and maintain higher psychological well-being. Finally, guidance and counseling programs should diversify their focus from aspects of life such as soft skills, ethics, thinking skills, career, and personality development. such aspects help prepare the client in improving their psychological well-being. The above suggestions are important to motivate and help the client to adapt to the various problems he or she is facing.

Other suggestions are related to improving the methodological and conceptual limitations found in this study. First, some important characteristics of clients such as age, gender, marital status, occupation, income and level of education should be explored in future studies. This can improve our understanding of how different client characteristics influence counseling sessions in different agencies. Second, longitudinal studies should be considered because they can show patterns of variables over a long period of time, provide useful data on individual changes, and assess the strength and nature of relationships between variables. Third, to increase the understanding of the intermediate effects of spiritual intelligence in counseling sessions in other agencies in Malaysia it needs to be studied in future research. Fourth, other specific theoretical terms about spiritual intelligence need to be explored and published so that they can be widely recognized as an important link between emotional intelligence and psychological well-being. Finally, probability sampling planning, especially stratified random sampling, should be considered as it will collect data at random, therefore it can reduce the bias from the usual method. The importance of the above-mentioned recommendations needs to be put forward further in future studies. This research has identified several methodological and conceptual limitations. First, this research has used a cross-sectional research design, which prevents causal inference between variables. Second, this research neglects testing the relationship between the specific dimensions of the mediating variable and the dependent variable. Third, this study only used client perceptions as a measure to assess the relationships between variables in the hypothesized model. Fourth, this research was conducted in a counseling service agency in Pahang only. Finally, the sampling plan aims to not be able to bypass the response bias. The above limitations may reduce the ability to generalize the results of this study to other agencies.

Acknowledgement

We would like to thank the Bahagian Penyelidikan dan Jaringan Industri (PJI) UiTM Cawangan Pahang (Project Code: 600-TNCPI 5/3/DDN (06) (012/2020)) and

600-TNCPI 5/3/DDN (06) (010/2020)) for supporting this research.

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The Role of Emotional Intelligence: Improving Personality Quality and Decision-Making Style Among University Students

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Abstract

Weaknesses in emotional management among students are very worrying even though the issue has long existed in society in Malaysia. However, there is confusion about existing emotional management's awareness, role, and effectiveness due to the lack of local studies. This study will be conducted to evaluate the role of emotional intelligence as a significant mediating variable in the relationship between personality and decision making. The survey method will collect 180 data from students in public universities throughout Malaysia. SmartPLS was used to evaluate the data content of the questionnaire form and test the research hypotheses. The findings of this study confirm that there is a positive and significant relationship between personality, emotional intelligence, and decision making. Furthermore, the findings of this study can be used as essential recommendations to help practitioners understand the diversity of perspectives on the constructs of emotional intelligence and decision making and develop students' personality management plans to help achieve and maintain their emotional well-being in daily life.

Key words

Personality, Emotional Intelligence, Decision-making, University, SmartPLS.

I. INTRODUCTION

Personality is an essential element in the educational infrastructure of students. Students with positive personality values can contribute to effectiveness, especially academic achievement. However, the development of the 21st-century world has dramatically changed the science and technology-oriented Education System. These changes are in line with the policies that the Malaysian government has implemented as in the 9th Malaysia Plan (RMK), Education Development Master Plan 2006-2010 (PIPP), Malaysia Education Development Plan 2013-2025 [1], and Teacher Standards Malaysia. All the intentions highlighted by the MOE align with the National Education Philosophy to produce first-class human capital, students who are balanced in learning and co-curricular, and have students who are suspended in terms of physical, emotional, spiritual intellectual (JERI) [2]. Although this goal is expected to be achieved, Malaysia still faces challenges involving student discipline problems such as vandalism, cruelty, suicide, and sexual misconduct [3]. The causes of this occurrence are influenced by life stress, emotional, social, and psychological disorders [4]. Continuing from this cause, personality differences arise, especially in building the moral system [3]. Differences in personality, behavior, and values influence how students perform a task, describe a situation, and face a challenge [5]. For example, many students are interested in discussing philosophy, values, and ethics of life. Yet without guidance from parents or other adults, they cannot build a life

value system that gives due place to naqliyyah knowledge, rational thinking, practical experience, and intellectual intuition. This is because, during adolescence, the process of emotional conflict is inevitable [6]. Hormonal changes can cause changes or agitation to occur suddenly; personality can also influence the adaptive performance of students, where individual personality traits lie in the process of adaptation to the environment and biological influences [63]. Individuals who adapt to the surrounding circumstances can determine the actions to possess good personality management, such as a positive attitude, a good sense of responsibility, and sensitivity to perform the role [7].

Thus, personality plays a vital role in managing emotions and decision-making style in daily life [8]. Students who are wise in assessing themselves will know their strengths, potentials, weaknesses, and personality traits [9]. According to psychologists, thoughts, perceptions, values, attitudes, character, abilities, beliefs, intelligence, motivations, and habits are embodied in the personality elements. The Big Five personality theory explains that daily individual personalities encompass various combinations of different behavioral outcomes [10]. The Big Five personality encompasses dimensions such as i) Neurotic (emotional stability), ii) Prudence, iii) Extraversion, iv) Consent, and v) Openness [11, 12]. The dimension of openness refers to a person's level of readiness to accept new experiences. The dimension of prudence refers to the level of order or

discipline, self-control, reliability, diligence, and motivation to achieve a goal.

Furthermore, the extraversion dimension describes a person's comfort level with social relationships. In addition, the consent dimension refers to the degree of a person's propensity to conform to the wishes of others. Finally, the dimension of neuroticism or its counterpart of emotional stability explains a person's level of resilience in dealing with stress [11, 13]. It is quite surprising when many studies on personality in the education sector show personality traits affect student achievement, psychological well-being, emotional intelligence, impairment in decision making, and academic performance [14, 15, 16]. For example, personality is typically associated with academic performance [62], dropout rates [59], learning [60], assessment preferences, or assessment methods [61], residential placement, orientation outcomes, leadership development, and counseling [59]. Yet, in the 21st-century, research is more focused on the effects of personality on emotional intelligence and decision-makers. Many scholars such as [7], [18], [19], and [20] see personality as strongly influencing students' emotional intelligence. This is evidenced when an upbeat personality or a positive mood becomes a factor in forming emotional intelligence. Yet, at the same time, a negative personality does not affect emotional intelligence. This means that feelings of anxiety, stress, hostility, shame, depression, and low self-esteem do not affect students' emotional intelligence.

Using the five personality traits in the study revealed that students' emotional intelligence will also be good when students' mood is good. A student who has a dominant extraversion personality is generous, active, assertive, and tends to have positive emotions. These characteristics become a catalyst for the formation of emotional intelligence among students. Individuals with extraversion personalities also tend to have good emotional intelligence and interpersonal and social interaction abilities [21]. Students who have a dominant character of openness to experience tend to be curious, adapt to various situations, and be creative and, most importantly, open-minded. This explains that students are prepared for any eventuality and have many difficult or easy life experiences compared to other personalities. This experience ultimately shapes students' emotional intelligence, perception, expression, understanding, and emotional management. In addition, students have an agreeableness personality possessing the nature of being obedient, willing to sacrifice, generous, sympathetic, forgiving, kind-hearted, trustworthy, and open to new ideas. Students of this personality are said to be flexible in various situations and learn new things [21]. These characteristics indicate that these students have good emotions and can quickly control and change negative emotions into positive ones. This feature is continuous with the emotional intelligence scale, i.e., emotional management. Finally, conscientious students have high self-control that can manage life, are efficient, reliable, wise to control lust, and rational. These features are also continuous with the emotional intelligence scale of emotional management.

Whereas decision-making style is a habitual response pattern exhibited by individuals when faced with decision situations [42]. If viewed in terms of theory and practice, understanding how people make decisions is one of the moral domains. Theoretically, it is related to the importance of understanding the moral mind to deepen further the knowledge of how the mind works, to understand the role of moral judgment in cognitive life. Practically, this understanding is closely related and influenced by ethical decisions [58]. According to [42], there are five different decision-making styles: dependent, avoidant, spontaneous, rational, and intuitive [42]. Each individual's decision-making style has characteristics from different styles and leads to a more dominant one [57]. Dependent decision-making styles need others' support, advice, and guidance while making decisions. Avoidance style refers to his tendency to procrastinate and postpone decisions if possible.

In contrast, the spontaneous decision-making style refers to making decisions quickly and impulsively. In other words, spontaneous decision-makers are immediate feelings who choose to bypass the decision-making process soon without using much effort in considering their choices analytically or relying on their instincts. In turn, rational decision-making style refers to using a structured, logical approach to analyze information and options for decision-making [42]. In contrast, the intuitive style relies heavily on a hunch, instinct, and feeling when making decisions that focus on the flow of information rather than the systematic procession and analysis of data, thus relying on premonition and feeling. Effective decision-making style is essential because human nature generally encompasses individual and group psychology and sociology [56]. In approaching the decision-making process, individual behavior is different. This difference is due to the specific way in formulating decision-making problems, understanding and analyzing available information, experience, interacting with people in the decision-making process [56]. Furthermore, there are sharp differences between oneself and others (surroundings).

Furthermore, several studies have evaluated the relationship between personality traits and emotional intelligence. For example, studies by [22], [24], and [23] found a significant relationship between emotional intelligence and all personality traits. Personality traits of extroversion, consent, and openness to experience emerged as significant predictors of emotional intelligence. The study also concluded that accuracy and neuroticism did not affect emotional intelligence. In addition, there are also studies evaluating the effect of personality traits on decision-making style. For example, studies by [25], [26], and [27] examined personality traits and decision-making styles among university students. These studies as a whole found that the accuracy of personality traits is associated with rational decision-making styles [26]. Decision-making style depends on one's personality style. For example, if an individual has extroverted personality traits, conscientiousness, and neuroticism, it positively affects spontaneous style.

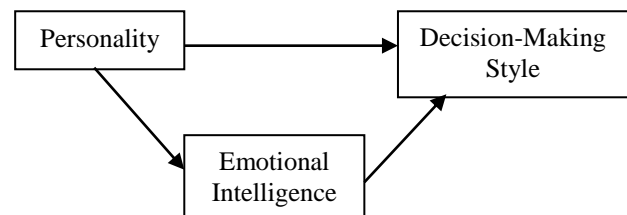
However, emotions strongly influence decision-making, making it an emotional process. Emotional involvement in a decision can affect a person's choices [28]; primarily, emotions serve as a motivational process for decision-making [29]. For example, patients with bilateral lesions on the ventromedial prefrontal cortex (interfering with standard emotional signal processing) experience severe impairment in personal and social decision-making despite normal cognitive abilities (intelligence and creativity); highlighting the role of guidance played by emotions in the decision-making process [30]. Furthermore, emotional intelligence affects attention, memory, and cognitive intelligence [31, 32]. This suggests that higher levels of emotional intelligence indicate more efficient decision-making [31]. [33] concluded that emotional intelligence has a significant positive effect on rational and intuitive decision-making style and a negative impact on university students' dependent and spontaneous decision-making style [33].

Suppose one looks at the results of previous studies. In that case, it can be said that students' personality types can lead to interpersonal differences, and there may be a mismatch between personality, emotional intelligence, and decision-making style [34]. Emotional intelligence influences the level of personal development, and any knowledge that helps mentally adapt to university life will contribute to the development of students' unique qualities [35]. Personality types also allow us to distinguish between predictable risk patterns for individual growth, helping teachers and parents educate children and take action when needed. Understanding students' personalities and learning styles can help educators better understand students, creating a more supportive and successful learning environment in teaching and learning sessions. As an example, studies by [36] and [37] examining Korean high school students to understand the role of personality in the development of student burnout syndrome will help identify individuals with mental health problems before enrollment and target interventions for those at high risk [38]. When students receive psychological help, it can positively impact their well-being and academic success [39]. The services provided by institutions to address students' personal and psychological problems are highly dependent on the school's philosophy, available resources, and campus needs. Comprehensive initiatives covering the areas of psychotherapy, treatment, prevention, awareness-raising, academic research, training, and careers enable institutions of higher learning to ensure services meet students' diverse personal and psychological needs. Therefore, university education should provide a conducive environment, healthy personality education in students, and activities to improve mental health, indirectly produce superior personality qualities, and encourage students to make the right decisions [35].

While the character of the relationship is essential, most past studies have only identified the processes and impacts of personality implementation with emotional intelligence, personality with a decision-making style, and emotional

intelligence with a decision-making style without explaining in detail the mechanisms affecting students. Furthermore, previous studies had limitations in examining emotional intelligence as a mediating variable when previous studies used moderate correlations to measure the strength of the relationship between dependent and independent variables. Most scholars believe that this may be due to several factors. First, past studies have elaborated extensively on how personality can be characterized, such as a conceptual discussion of the definition, type, purpose, and importance of personality. Second, previous studies have conducted a brief survey to elucidate respondents' opinions regarding personality practices. Third, sample studies have shown a simple correlation method to determine the strength of the relationship between personality, emotional intelligence, and decision-making style. Not much is dedicated to the importance of emotional intelligence as a mediating variable between personality and decision-making style among university students, especially in Malaysia, in developing a personality model. Thus, this encourages researchers to explore more deeply and fill the gaps of past studies. This study provides a specific guide to educators to understand the concept of personality, emotional intelligence, and its impact on decision-making style by a student.

The literature review has been used as a foundation to establish a theoretical framework, as illustrated in figure 1.



II. Research Design

A. Population and Sample

The location of this study is in Public and Private Universities, Malaysia. The study distributed 200 questionnaires, and 180 usable questionnaires were collected from three public universities and two private universities. For the specific purpose of this study, the sampling plan was used to collect questionnaires because the university did not provide detailed information about students due to confidentiality. Therefore, this constraint does not allow researchers to use random sampling techniques in selecting participants for this study. Participants answered the survey questionnaire based on their consent, anonymously and voluntarily. In addition, the Harman single factor test was further conducted as proposed by [40] to discover the bias caused by the survey method. This test showed that the percentage of variance was 45.5, and this value was lower than the 50 percent variance [40], indicating that bias was not present in the questionnaire data.

B. Variables Description

The survey questionnaire was divided into four sections. The first section deals with demographics, including gender, age, address, religion, citizenship, university, parental education, parental income, chronic illness, and medication intake for

the mentally ill. The second part deals with the personality element. The Big-Five Personality question came in 5 items adapted from [41]. The third part deals with emotional intelligence. This section has five things adapted from Paul Mohapel's Model (2015). The fourth section deals with decision-making style. There are four items for this section, adapted from the study of [42]. A 5-item Likert scale ranging from "strongly disagree/dissatisfied" (1) to "strongly agree/satisfied" (5) were used to assessed the whole items. Additionally, the technique of back-to-back translation is utilized to translate the questionnaire survey into English and Malay, thereby enhancing the quality of the study findings [64].

C. Data Analysis

As recommended by [43], the SmartPLS is used to analyze data because it can deliver latent variable scores, handle small sample sizes and less ordinary data, and evaluate the complex research framework. The data analysis procedure is: Firstly, confirmatory factor analysis is employed to assess the reliability and validity of the measurement scale. Secondly, the significant hypotheses are identified if the value of the t statistic is more than 1.65 (one tail testing) [44]. Thirdly, the indirect effect model is tested, and the significant hypotheses are recognized if the value of t-statistic is more than 1.96 (two tail testing) [44]. Fourth, the R2 value is utilized as a criterion for the overall predictive strength of the model based on the following baselines: 0.19 (weak), 0.33 (moderate), and 0.67 (substantial) [43, 44]. Fifth, the f2 value is used as a guide to decide upon the effect size of the predicting variable in the model based on the following rules: 0.02 (weak), 0.15 (medium), and 0.35 (large) [43]. Sixth, the Q2 value is employed as a measure of predictive relevance based on the following criteria: 0.020 (weak), 0.15 (medium), and 0.35 (large). Lastly, the standardized root means square residual (SRMR) value is lower than 0.1 and applied as a model fit criterion [43].

III. ANALYSIS AND DISCUSSION

Table 1 shows that the majority of the participants were female (59.4%), aged between 20 to 22 years old (88.9%), Rural (52.2%), Muslim (95.0%), Malay (98.3%), Public university (55.6 %), Overall Mother's Education at MCE/SPM/SPMV level (28.9%), Overall Father's Education at MCE/SPM/SPMV level (35.0%) and Parental Income less than RM1999 (33.9%).

Table 1: Summary of participants' characteristics

Participants' Profile	Sub-Profile	Frequency	Percent
Gender	Male	73	40.6
	Female	107	59.4
Age	20 to 22 years old	160	88.9
	23 to 23 years old	13	7.2
	More than 29 years old	7	3.9
Address	Urban	86	47.8
	Rural	94	52.2
Religion	Muslim	171	95.0

Department	Non-muslim	9	5.0
	Malay	177	98.3
	Cina	1	0.6
University	India	2	1.1
	Public University	100	55.6
	Private University	80	44.4
Mother Education	LCE/SRP/PMR	25	13.9
	MCE/SPM/SPMV	52	28.9
	HSC/STPM/STAM	17	9.4
	Certificate/Diploma	32	17.8
	Degree	47	16.2
	Others	7	3.9
	Father Education	LCE/SRP/PMR	25
Parents Income	MCE/SPM/SPMV	63	35.0
	HSC/STPM/STAM	14	7.8
	Certificate/Diploma	24	13.3
	Degree	43	23.9
	Others	11	6.1
	Less than 1999	61	33.9
	2000 to 2999	27	15.0
3000 to 3999	17	9.4	
4000 to 4999	23	12.8	
5000 to 5999	9	5.0	
More than 6000	43	23.9	

Note:

SPM/MCE : Sijil Pelajaran Malaysia/ Malaysia Certificate of Education

STPM : Sijil Tinggi Pelajaran Malaysia/ Malaysia Higher Education Certificate

A. Correlation Analysis

Table 2 illustrates that the loadings for all constructs are more significant than 0.70, and the average variance extracted (AVE) values for all constructs are higher than 0.50 [45, 44]. This shows that they have satisfied the criteria of the convergent validity analysis. Meanwhile, the composite reliability values for all constructs were higher than 0.80 [46], showing that the measurement scale has high internal consistency.

Table 2: The Outcomes of Convergent Validity Analysis

Construct	No. of Item	Factor Loadings	AVE	Composite Reliability
Personality	5	0.721-0.876	0.643	0.900
Emotional Intelligence	5	0.707-0.859	0.604	0.884
Decision-making	4	0.785-0.864	0.698	0.902

Table 3 establishes that the values of the Heterotrait-monotrait (HTMT) ratio of the correlation for all constructs were less than 0.90, and the values of confidential interval for all constructs shown in the parenthesis were less than 1 [43, 44], proving that the constructs have satisfied the criteria of the discriminant validity analysis.

Table 3: The Outcomes of Discriminant Validity Analyses

Construct	HTMT	
	Personality	Emotional Intelligence
Emotional Intelligence	0.761 (0.567, 0.727)	
Decision-making	0.474 (0.111, 0.457)	0.435 (0.026,0.370)

Note: The values in the parenthesis are the values of confidential interval at 5% and 95%

Table 4 shows that the means for all constructs are between 4.000 and 4.7355, showing that most participants view personality and decision-making style from high (4) to the highest level (7). Besides, the values of the variance inflation factor for the relationships between personality and decision-making style were lower than 5.0, showing that the collinearity problem is not present in such relationships [43].

Table 4: The Outcomes of Variance Inflation Factor and Descriptive Statistics

Construct	Mean	Standard Deviation	Variance Inflation Factor	
			Emotional Intelligence	Decision-Making
Personality	4.7355	0.65759	1.000	1.732
Emotional Intelligence	4.4769	0.80930		1.732
Decision-Making	4.0000	0.63312		

B. Hypothesis Testing

Table 5 presents that the inclusion of EI in the analysis had contributed 42.3 percent of the variance in P. The values of R2 for EI are higher than 0.33 (Cohen, 1992), indicating that these models have a substantial effect. The inclusion of DM in the analysis had contributed 20 percent of the variance in P and 19 percent of the variance in EI. So, the values of R2 for DM are equal to or lower than 0.26 [47], indicating that these models have a lower effect. Conversely, the inclusion of P and EI in the analysis had contributed 42 percent of the variance in DM. The values of R2 for EC are higher than 0.33 [47], indicating that this model has a substantial effect.

Testing the research hypotheses displayed three significant findings: first, P was positively and significantly correlated to EI ($\beta=0.650$; $t=15.970$); therefore, H1 is supported. Second, P was positively and significantly correlated to DM

($\beta=0.289$; $t=6.413$); therefore, H2 is supported. Third, EI was positively and significantly correlated to DM ($\beta=0.199$; $t=2.221$); therefore, H3 is supported. Fourth, the relationship between P and EI was correlated considerably to DM ($\beta=0.129$; $t=2.212$); therefore, H4 was supported. Overall, these findings confirm that a) P causes EI and DM, and b) perceived EI mediates the effect of P on DM. For a better understanding, the test is illustrated in Figure 2.

Table 5: Testing of Hypotheses 1, 2, 3 and 4

Hypothesis	Standardize Beta (β)	T-Statistics	R2	Decision
H1: P \rightarrow EI	0.650	15.970	0.423	Accepted
H2: P \rightarrow DM	0.289	6.413	0.200	Accepted
H3: EI \rightarrow DM	0.199	2.221	0.190	Accepted
H4: P \rightarrow EI \rightarrow DM	0.129	2.212	0.420	Accepted

Note: Significant at *t value > 1.96 (two tail test)

P : Personality

EI: Emotional Intelligence

DM : Decision-Making

The type of mediating effect, effect size (f^2), model fit, predictive relevance (Q^2), and predictive performance (Q^2 -PLS Predict) were further tested. The hypothesized model's mediating effect (i.e., EI) is a partial mediating effect. This result explains that a partial mediating effect occurs when the direct effects model (relationship between P and EI, P and DM, EI and DM) and the indirect effects model (relationship between P, EI, and DM) are significant and point in the same direction [49].

Second, the effect size results showed that the relationship between P and EI is 0.732, which is higher than 0.35 [43]. This result indicates that P has a high effect on EI. The relationship between P and DM is 0.060, higher than 0.02, and lower than 0.15 [43]. This result indicates that P has a weak effect on DM. The relationship between EI and DM is 0.028, higher than 0.15, and lower than 0.35 [43]. This result indicates that EI has a medium effect on DM.

The value of standardized root means square residual (SRMR) is 0.098, lower than 0.1 [43], signifying that this model is a good fit. The results of Blindfolding showed that EI had a Q^2 value of 0.244 and DM had a Q^2 value of 0.124, which are higher than zero [43]. This result indicates that these latent exogenous variables have predictive relevance. Further, PLS-Predict is conducted to predict the model performance. Table 6 shows that the PLS-SEM RMSE (root-mean-square error) had positive values. This result indicates that none of all indicators in the PLS-SEM analysis has higher RMSE (or MAE) values than the naïve LM benchmark; the model has high predictive power [48].

Table 6. PLS-Predict Showing the Results of LM and PLS-SEM

Items	LM	RMSE	PLS-SEM	RMSE
	Values	–	Values	- LM
	PLS-SEM	RMSE	RMSE	Values
	Values			
C25	0.870		0.887	
C30	0.949		0.911	
C11	0.784		0.789	
C29	0.855		0.827	
C31	1.040		1.022	
D3	0.680		0.678	
D5	0.726		0.728	
D2	0.718		0.710	
D4	0.746		0.728	

IV. DISCUSSION

This study shows that emotional intelligence plays an essential mediating variable in the relationship between personality and student decision-making style. A comprehensive review of the questionnaire revealed that moderate emotional intelligence mediates the effects of personality and decision-making of students, which may be due to several internal factors. First of all, control over curiosity. As students have diverse interests, they will participate in various excellent and harmful activities. So in this context, students need to control such curiosity so as not to push them to make hasty decisions and systematically balance each exploration activity. Second, understand and accept one's abilities. Each individual will feel that they have different skills than others. There will automatically be isolation and loneliness when there is a lack of self. This requires comprehensive guidance and education to understand individual differences better and cultivate self-awareness that every human being has specific strengths and weaknesses. Third, do not accept others. Some students pay full attention to their activities, tend to isolate themselves, and are constantly showered with praise until they develop an attitude of underestimating the abilities of others [50]. They become arrogant and overly proud of themselves. In this context, students need guidance to understand and appreciate the concept of spiritual consciousness, with only God being perfect and worthy of all praise [51]. Fourth, failing to create a sound system of social interaction. University students often have trouble making good social interactions. They like their work, don't like being a follower of a group of peers, and it's not an easy subject to cultural demands [52]. In this context, intelligent learners need guidance to get along with peers and adults but not to obey the wishes of others blindly. Instead, they need to learn to be independent without isolating themselves from society. Finally, not being serious about meeting the expectations of parents and teachers. Some parents place unreasonable expectations that cause emotional and psychological problems for their children. Parents are also forcing their children to study full-time without adequate rest time [53]. At the same time, teachers create an unproductive classroom climate when they make wrong impressions and

compare students. This concept should be discarded and avoided so that the home environment and classroom climate are always constructive. If this situation is ignored, it allows reflection and abstraction to construct schemes of action and methods of operation to become so challenging to carry out in an uneasy atmosphere. These factors have a severe impact on the formation of personality, emotional intelligence, and decision-making style by a student. Therefore, stakeholders should pay attention to these factors so that students' personality qualities, emotional intelligence, and decision-making style can be born perfectly.

This study provides three significant impacts: theoretical contributions, the robustness of the research methodology, and practical contributions. In terms of theoretical contributions, the findings of this study confirm that emotional intelligence acts as an essential mediating variable in the relationship between personality and decision-making style. These results are consistent with a five-factor model. This model has emphasized that personality has traits closely related to emotional intelligence. The study of [54] compares the validity of the criteria of various types of tests that measure a five-factor model of personality and concludes that a five-factor model is most appropriate for measuring personality among all categories. At the same time, emotional intelligence is understood in two concepts. First, measured in terms of mental and cognitive ability. Second, emotional intelligence as a trait should be measured through self-report measures. Thus, the characteristics and capabilities of emotional intelligence can be measured through performance testing, and it is not expected that it has a strong correlation with personality factors. It is very closely related to general cognitive ability, affecting decision-making style. These findings support and extend the study of personality by [7], [18], [19], [20], [24], [23], [25], [26], and [27] revealed that the role of personality indicates the process of formation of emotional intelligence. Therefore, a personality development program is an initial step in improving students' personalities and emotional skills. Considering the effect of personality traits on this intelligence, this study was conducted to help students themselves, including the school and teachers, shape the personality needed to improve emotional intelligence and, subsequently, students' mental health. As a result, students will be wise and rational in making appropriate decisions. Regarding the robustness of the study methodology, the data of the study questionnaire have met the criteria of validity and reliability satisfactorily. This situation can help in improving the accuracy and reliability of research results. Furthermore, regarding practical contributions, the results of this study can offer helpful guidelines for use by students to enhance personality effectiveness in the university. This objective can be achieved if university students pay attention to the following aspects: first, leadership development programs need to be taught interpersonal and intrapersonal qualities. Second, Personal development skills. Personal development skills are qualities and skills that help students grow personally and professionally. Students can improve their development skills by taking lessons, learning from people around them, acquiring new talents, and improving

existing ones. Third, communicating skillfully will further enhance positive student personal outcomes—fourth, continuous learning. Students must strive to improve and maintain a growth mindset, receive help when needed, and take responsibility for their success and growth. In this way, students will enhance the educational experience to live more comfortably, be less stressed, and ultimately become better students. Finally, show respect to teachers, school staff, and classmates. If students take suggestions as a guide, this may encourage students to become better students in morals and emotions.

Therefore, current research and practice in personality models need to incorporate emotional intelligence as an essential dimension in the personality domain. This study further suggests that the process of self-development of students' personalities should be implemented continuously to produce intellectually and emotionally literate students. Therefore, these positive outcomes can enhance efficient thinking and accurate decision-making style. This study has some methodological and conceptual limitations. First, there was only one-time data collection during the study period or related to cross-sectional research design. The main disadvantage of this design is that the researcher cannot determine the causal relationship between constructs, even though a simple relationship exists. Second, the sample of this study was taken from public and private universities only and was not comprehensive. Third, surveys were the only method used in data collection. Other methods such as interviews and observations were not used in this study; the findings will likely be more accurate if done. Finally, the results of personality traits are not discussed in this study, and this limitation may reduce the ability to generalize the results of this study to other university settings. This study provides important recommendations for improving future studies. First, researchers can consider longitudinal study designs to improve causal relationships between variables [55]. Second, to further strengthen the quality of the findings, future studies may also involve several organizations to obtain a more comprehensive view. Third, future studies can use data collection methods to get more accurate information. Fourth, more student personality outcomes can be discussed in detail for future research. Such recommendations should be considered to solidify future studies.

V. ACKNOWLEDGMENT

We would like to thank the Geran Penyelidikan MyRA Lulusan PhD (LPHD) (Project Code: 600-RMC/GPM LPHD 5/3 (111/2021)) for supporting this research.

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Physical Activity, Cardiorespiratory Endurance and Prevalence of Obesity Based on Socioeconomic Status of Family Among School Children

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Abstract

High socioeconomic status has association with the factors of non-communicable diseases such as obesity due to inactive lifestyle. The different in socioeconomic status has contributed to changes in lifestyle. The aim of this study is to determine the differences of body mass index, physical activity habit and cardiorespiratory endurance capability according to the household income. A total of 420 school children aged 10 to 12 years old participated in this study. The height and body weight of the participants student were recorded. The students were also asked to perform 1600 meters run for cardiorespiratory endurance test and required to complete the Children's Leisure Activities Study Survey (CLASS) questionnaire. A non-parametric test was conducted which is Kruskal - Wallis Test to analyse the differences of socioeconomic status on physical activity, VO₂max, and body mass index. Kruskal - Wallis Test analysis shows a significant difference in BMI and VO₂max among boy and PA for both boys and girl from different income level. However, there is no significant different on VO₂max and body mass index among the girl from a different income level of a family. In conclusion, in order to increase participation in physical activity, children need to be informed about the importance of physical activity. Parents and teachers need to teach children the importance of good nutrition and physical activity. Limited space at home is one of the barriers to children's physical activity. They are depending on the availability of the nearby playground to play.

Key words

Body Mass Index, Cardiorespiratory Endurance, Physical Activity, Socio-economic Status.

I. INTRODUCTION

Malaysia is currently experiencing a rapid development process due to the increasing in socio-economic development. This progression indirectly impacts the demographic and socioeconomic profile of the population. The high socioeconomic status of the family could contribute to the obesity issue and the leads to inactive lifestyle [1]. Childhood obesity poses a global public health threat and has risen to an alarming level throughout the world. There were many factors or reasons that caused overweight and obese in children. For example, improper eating that may cause malnutrition and sedentary lifestyle, or the combination of both factors were usually inherited from their parents [2]. The Third National Health and Morbidity Survey reported that there were 5.4% of overweight children aged below 18 years old in Malaysia in 2019 [3]. The highest group was among children age ranged from 7-12 years old. Statistics proved that those children were affected by their lifestyle

especially they were contented with entertainment rather than engage in physical activities [2]. The increase in obesity among children is critical, especially when adults are not aware of the side effect of obesity. Children tend choose fast-food and junk food without parental supervision. Moreover, the lack of knowledge in choosing healthy food were also led to increase in calory intake.

Recently, the world has normalised the use of electronic medium and gadget for socialize and learning through online platform due to pandemic covid-19. Regrettably, this trend has turns negatively towards people's daily lifestyle, especially for young generation. They have to spend their time on screen during school session and playing video games and watching television on leisure time, which makes them less interested in doing physical exercise. This daily routine may cause sedentary lifestyle that lead to several non-communicable disease such as obesity. moreover, obesity also one of the most serious public health problems in the 21st century. About one-tenth of adolescents aged 5-17

are overweight and obese. In recent years, this proportion has steadily increased in many countries and regions. In developing countries, the number of adolescents with obesity problems is higher than that in developed countries, which is attributed to changes in lifestyle and eating habits [4].

Socio-economic status is one of the important factors affecting children's sports activities. Children with low socioeconomic status are less enthusiastic about participating in sports competitions because they are more likely to have fun outdoors than children with high socioeconomic status. Most of leisure and outdoor activity such as jogging, hiking, and playing football at the field that are less cost compared to participating in sports that need proper equipment and court rental. Physical activity is very important for children because it can avoid and prevent them from getting any disease. So, through physical exercise, children will burn the calories and enhance their cardiovascular endurance. In addition, physical activity is one of the important things that children need to do, because a healthy body can prevent them from getting diseases when they grow up [5]. The advancement of technology nowadays such as televisions, computers, and video games will affect physical activity among children. Understanding the factors or predictors which affecting the adolescent's physical activity levels is needed to be studied in order to promote physically optimally. Socio-demographic and health-related factors were two broad-ranged factors that could influence the level of physical activity and physical fitness [6]-[7]. It is important for an individual to have at least basic fitness knowledge to get the benefits out of adequate fitness. More children are getting fat and less fit caused them to face a great risk of health disease. Health-related physical fitness is influenced by various other factors, such as body size, time spent performing the physical activity, and family income [8]. Besides, some determinants or influences on being overweight or obese include socioeconomic status. Income level may be the most frequently used socioeconomic status indicator in health status. It has still been debated how socioeconomic status and obesity were related.

In Malaysia, in terms of socioeconomic, physical activity, physical fitness (cardiorespiratory endurance) and the prevalence of obesity have reported that there are many children and adolescents who are physically inactive [6], [9], [10]. However, there was still insufficient evidence regarding these issues. Therefore, this study determines the influence of socioeconomic status of the family to the physical activity level, physical fitness (cardiorespiratory endurance) level, and body composition among school children.

II. METHODOLOGY

A. Research Design

Submit The design used in this study was a cross-sectional study focusing on school children aged between ten to twelve years old. This study was designed to explore the differences between physical activity, cardio-respiratory endurance and body composition based on the socio-economic status of the family. The participants were recruited from selected several primary schools and with the consent of parents/guardians.

The participants were briefed verbally during the meeting. The protocol and potential advantages were explained to the participants before they were given the consent form to be filled by their parents or guardian. The approval was obtained from the Education Planning and Research Department (EPRD), Ministry of Education Malaysia, and the State Education Department as well as the school authorities prior to data collection.

B. Research Participants

The stratified data sampling was chosen for participant selection. A total number of 420 participants (210 boys and 210 girls) were recruited in this study with the mean age 11.32 ± 0.74 years old. The children were divided into three household income categories which are high household income (HHI), middle household income (MHI), and low household income (LHI). The criteria of the household income were referred to Malaysia Economic Planning Unit classification 2007 for semi urban area. The high household income was referred to the whom earned RM3500 per month, the middle household income received between RM1500 to RM3499 per month and the gross income lower than RM1500 belongs to the category of low household income. In this study the participants were informed, a week earlier to attend a meeting and understand the requirement of this study. They completed research consent form after agreed to participate in this study.

C. Research Variables

i. Body composition measurement

The participant's height and weight were recorded in the units of meter and kilogram, respectively. the obtained values the were then transform into formulation of body mass index to obtain the BMI value in the unit of kg/m^2 . BMI is the ratio of body weight to height squared to determine the classification of body composition but does not estimate the body fatness of the participants. It is used to analyse and differentiate the participants according to underweight, normal, overweight, and obese categories (ACMS, 2010). [11].

ii. Cardiovascular endurance test

The battery test chosen to evaluate the cardiovascular endurance test status was 1600-meter run. the participants told to completed 1600 run regardless how much time they needed. The time were recorded for main analysis.

$$\text{VO}_{2\text{max}} (\text{ml}/\text{kg}/\text{min}) = 108.94 - 8.41[\text{time} (\text{min})] + 0.34 [\text{time} (\text{min})]^2 + 0.21 [\text{Age} (\text{year}) \times \text{Gender}] - [0.84 \times \text{BMI}]$$

Where, for gender, the value of 1 for boy, and the value of 0 for girl

iii. Questionnaire

The physical activities status of the participants was determined by using Children's leisure activities study survey (CLASS) instrument. The CLASS comprises 27 items to retrieve a weekly physical activity routine which undertaken in different behavioral domains namely, sports, leisure activities, and transportation. The questionnaire

slightly modified version of an existing survey instrument that has been shown to provide reliable estimates of the type and frequency for 10 to 12 years old children. Direct measures such as observation and accelerometers can be used but not feasible in large epidemiologic studies. Due to this constrain, this study unable to use accelerometers to measure the energy expenditure for physical activity. The questionnaire was translated into Malay language and Cronbach alpha have been reported as $\alpha=0.82$.

D. Statistical Analysis

The data were analysed by using XLstat by addin software. The descriptive statistics for all variables were presented in the form of means, standard deviation, frequency, and percentage. A non-parametric test, Kruskal-Wallis Test, were selected to analyse the differences of socioeconomic status on body composition, total minutes of physical activity, dan VO₂max. Multiple pairwise comparisons using the Steel-Dwass-Critchlow-Fligner procedure were applied to determine differences of the variable between each socioeconomical group. An alpha level of .05 was set to determine the significance for all comparisons in this study.

III. RESULT

Table 1 shows the descriptive analysis of BMI, VO₂max and total time spent on physical activity among boys and girls including the mean and standard deviation. The mean of BMI for boys is 20.63 kgm⁻², lower than the girls which recorded 22.58 kgm⁻². For the performance of VO₂max, both boys and girls recorded have almost similar value, 42.13 ml/kg/min and 42.86 ml/kg/min, respectively. Next, the boys spent more time for physical activity compared to girls where they have spent about 676.62 minutes per week, where the girls spent about 582.05 minutes for physical activity.

Table 1: The mean and standard deviation of the variables: BMI, VO₂max and physical activity

Variables	Boy		Girl	
	Mean	SD	Mean	SD
BMI (kgm ⁻²)	20.63	4.81	22.58	4.51
VO ₂ max (ml/kg/min)	42.13	4.07	42.86	3.81
PA (min)	676.62	155.55	582.05	155.73

*BMI-Body mass index, VO₂max-Maximal oxygen consumption, PA-physical activity

The application of Kruskal-Wallis to determine the differences between three social economical group. the table 2 display the result obtained from the analysis. For boys, all the parameters revealed there are significant differences

between three socioeconomical groups, whereas, the girl group discovered that only time spent on physical activity shows significant different between three socioeconomical groups.

IV. DISCUSSION

The difference in socioeconomic status will influence physical activity levels among school children. A broad range of factors such as biological, health-related factors, and socioeconomic status can also influence physical activity levels [6]. In order to find out the level of physical activity of the school children from a different income level of family, this study found out a statistically significant difference in physical activity scores between different three income levels of family. The study discovered the differences in family income level of physical activity among schoolchildren. This finding was similar with the study done by as in [12], who reported that parental involvement and environment influence the level of physical activity and greater participation among school children. Without family involvement in changing dietary behaviors and physical activity, it is difficult for children to change and maintain these behaviors, especially when the school environment is related to unhealthy food and drink choices and there is less support for physical activity [13].

Physical fitness especially cardiorespiratory endurance is considered as a significant marker of health [14]. Socioeconomic status was often indicated as a factor that influences physical activities and associated health. Furthermore, if children increased their physical activity levels, they will reach the fitness performance the same as those who were physically active at baseline [15]. The findings of this study showed that 316 participants (75.24%) were in the “healthy fitness zone” categories. There were 108 participants from the upper class as well as middle class and 100 participants from the lower class were in the “healthy fitness zone”. This finding was aligned with a previous study which found that school children from high socioeconomic status had a greater “healthy fitness zone” on cardiorespiratory endurance [16]. This study has shown that there is no significant difference in VO₂ max among children from families of different income levels. This finding was supported as in [7], who reported the discrepancies among studies might be due to the specific social and cultural contexts of each country. For example, different environmental factors or different income levels of families together with the different methodologies used to assess fitness and socioeconomic status

Table 2: Comparisons result by using Kruskal Wallis test

Gender	Socioeconomical Group	Frequency	BMI			VO _{2max}			PA					
			Sum of ranks	Mean of ranks	Groups	Sum of ranks	Mean of ranks	Groups	Sum of ranks	Mean of ranks	Groups			
Bo y	1	70	7760.00	110.85	A	B	7028.00	100.40	A	B	4945.00	70.64	A	
	2	70	6298.00	89.97	A		8479.00	121.13		B	9067.00	129.53		B
	3	70	8097.00	115.67		B	6648.00	94.97	A		8143.00	116.33		B
Gir l	1	70	6668.50	95.26		A	8145.00	116.36		A	6557.50	93.68	A	
	2	70	7738.50	110.55		A	7001.00	100.01		A	7284.50	104.06	A	B
	3	70	7748.00	110.69		A	7009.00	100.13		A	8313.00	118.76		B

This study attempts to explain the level of family income that may influence family income levels play an important role in influencing health-related fitness especially on body mass index [9]. The estimated body the prevalence of obesity in schoolchildren. Factors such as different fat percentage was one of the best measures of adiposity and recommended by the Fitnessgram, whereas the body mass index was an indication of the appropriateness of the individual’s weight relative to height, a less accurate indicator of body fat. Total body fat was often reflected by the body mass index (BMI) while summing of skinfold thickness for body fat centralization. According to the findings in the present study, it was found that most participants in the obese category were from the lower-class group (47 participants) followed by the middle-class group (40 participants) and the upper class only 37 participants. It was parallel with the finding of other studies whereby it was observed that children of lower socioeconomic status or low-income level of the family were more likely to be overweight or obese [17]. However, in other studies, it was reported that children from higher-income families are more prone to be obese. This is because Families from high-income status are more likely to consume foods outside the home which high in calories, fat, and cholesterol [18]. A long time ago, numerous researchers used height and weight measurements as indicators of physical growth. Body mass index (BMI) becomes one of the easiest and most reliable methods of estimating body fat. In other words, body mass index (BMI) was considered an indicator of the height and weight relationship. Body mass index shows a positive association with socioeconomic status [19].

V. CONCLUSION

In conclusion, it shows that physical activity among school children is influenced by different family income levels. Meanwhile, physical fitness and the prevalence of obesity did not influence by different family income levels. In this study, it was found that socioeconomic status has a great influence on physical activity among schoolchildren. Physical activity among schoolchildren has become an important issue in

public health. A proactive instrument is helpful in identifying more factors that influence physical activity and to increase the level of physical activity among school children. School children especially from upper-class groups need to know and be educated about the importance of physical activity including education on how to increase lifestyle-related to activities such as aerobic, physical education, and others. Outside of school, children should not only focus on the sedentary activities like playing computer games, watching television, and others. A support from family is important in encouraging children to engage in physical activity. However, families from different socioeconomic backgrounds encourage their children in different ways. For example family from high-income level tend to send their children to exercise classes such as Zumba, aerobic, ballet and other compared to the family from lower-income who shows an example to their children such as doing more work at home, going to the park and also encourage their children to play outside their home with friends.

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Analysis of Spectral differences between Printers to detect the Counterfeit Medicine Packaging

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Abstract

Counterfeited medicine is a major threat to the society and economy. The easiest way of producing fake medicine is counterfeiting the packages of medicine. Medicine package printing is generally counterfeited by scanning the original printed package using camera, scanner etc. and then reprinting it. When the original print is scanned through different mobiles, camera or scanners, the color values are not the same as the original. When the scanned objects are reprinted with different printers, the color values may be different depending on the profile of the printer. The spectral data of the solid inks used cannot be corrected as it is dependent on the inherent characteristics of the inks used. In this study, the original prints are scanned and then reprinted with the original (reference) printer, as well as in three different (test) printers, to show difference of spectrums. The inequality of spectrum of solid colors has been analyzed for printed and reprinted samples. The differences between RMSE values have been analyzed for same and different printers for different color range domains of the visible spectrum. It has been assumed that these differences could be used to detect whether a print is original or not. It may be used to protect medicine packaging from counterfeiting.

Key words

Reflectance Spectrum, Scanned reprint, RMSE, CMYK, Printer Authentication.

I. INTRODUCTION

Due to the increase of counterfeiters and development of internet authentication and protection of documents generates new series of challenging problem. After scan and print attack, color features can be used to detect original sample. The use of a Color Management System (CMS) is required to perform tasks such as device calibration, device characterization, color correction and quality evaluation. Color calibration of non-conventional devices, such a rotogravure printers, and non-conventional materials, such as aluminum foils paper, is not an easy task. But it is a necessary task to preserve image quality of prints on reflective materials and to check if a print is original or not. In this study, the inequality of reflectance spectrum of printed colors has been studied in the visible range of red, green and blue domains. It has been demonstrated that scan and print processes create not only color distortions but also spectral distortions that cannot be compensated by any color correction method.

II. LITERATURE REVIEW

The present work is based on gravure printing on blister foil. To the best of our knowledge very few works has been done in this area. The main issue with aluminum foil papers is that this material is very specular and for such material, conventional color calibration methods do not perform well in general [1].

Among these methods, a color calibration [2] solution defined for digital cameras. This solution is based on a forward and inversed colorimetric characterization process which takes into account lighting conditions. They proposed a calibration method based on two different processes in order to cancel the impact of lighting condition changes. Either the acquisitions done by digital cameras are performed under the same lighting conditions and in this case the method is based on their colorimetric characterization; or the acquisitions done by digital cameras are performed under different lighting conditions (e.g. D65 and D50) and in this case the method is based on the forward and inverse colorimetric characterizations (D65 \rightarrow D50, and D50 \rightarrow D65). Color calibration solution [3] was developed for input devices (scanner or digital camera), display devices (monitor) and output devices (printer). This solution uses a multi-dimensional look up table to register the color values of each channel Table entries are then computed by interpolating these color values in the tetrahedron sample space. Reflection spectrum of halftone samples was used as color prediction model (Neugebauer model). This solution has the advantage to request less number of samples and physical parameters than some other methods to calibrate input/output devices.

Another issue with gravure printing on blister foil is that the color samples printed on foil papers are printed with a rotogravure printer. It is very difficult to colorimetrically

calibrate such printer as many parameters, such as the ink viscosity or concentration [4], may impact the quality of the print. Furthermore, the quality of a print does not depend only of the color signature of the inks used but also of their spectral signature. Some papers proposed a solution to compare spectral signatures, among them spectral data and color values (chroma, brightness, hue) has analyzed with two methods [5], the Principal Component Analysis (PCA) and Segment Classification (SC). They tested the accuracy of these two techniques in comparison with other color assessment methods. The Yule–Nielsen Spectral Neugebauer model has used for printer characterization. They thus studied the feasibility of complex spectral characterization of binary printer. Reflectance spectra difference has evaluated using a metameric index [7]. This index was defined in reference to the sensitivity of the human visual system to evaluate color differences and it is not dependent on the illuminant conditions. Different metrics like ratio of spectra, root mean square error, Goodness of fit coefficient have been compared [8]. This study shown that none of these metrics performs better than another and that their use is dependent on the application.

The main purpose of our study is to address the problem of authentication of printed artworks on foil papers using a rotogravure printer (CMYK printing process). Unfortunately most of papers of the state of the art studying the quality of prints are based on ink jet printers, furthermore few studies, such as [9], studied the quality of gravure spot color reproduction. Print quality has computed on different types of substrate for gravure printing [10]. Gravure printing quality is influenced by various factors, such as substrate properties, ink chemistry, viscosity, doctor’s blade angle, cylinder pressure, rheological behavior, solvent evaporation rate, drying printing speed, etc. They studied print quality on non-porous substrates like milky poly, polyester and BOPP. They compared the density and dot gain values for Cyan, Magenta, Yellow and Black (CMYK) channels for these three types of substrates. They reported that, for all substrates, the density value of black (K) color is almost the same, and that the density values for C,M,Y colors are higher for polyester and milky-poly substrates and almost the same for BOPP substrate, with the same trend for C,M,Y colors. All C, M, Y and K colors showed almost similar trend from all tint levels (10%-100%) with different dot gain values. They also showed that process Y color had least dot gain while K color had maximum dot gain meanwhile the print quality was different for different substrates.

Among all papers dealing with an algorithm for detecting counterfeited bills produced by a scanning and printing technology [11]. They developed a deep learning algorithm based on a convolution neural network (CNN) model to detect counterfeit bills and forgery devices used. The used grey level co-occurrence matrix to extract noise features from printing devices to identify the forgery devices used. They analyzed their algorithm using three different laser printers. They demonstrated that the detection accuracy increase with the increase of epochs. They claimed that their algorithm

could be used to discriminate between original and counterfeit bills and also to identify the forgery devices used.

III. METHOD, PROCEDURE AND TESTS

In this study, the artwork IT8.7/3 Color Chart (See Fig. 1) was engraved as reference image on a gravure cylinder using an Electro-mechanical engraved process. Then, a 4-color gravure machine (CMYK printer) was used to print the engraved artwork on several foil papers using different color gravure printers of a printing factory. The reference image was printed on blister foils for a specific set of parameters such as surround temperature, humidity, heating, ink viscosity, gravure speed, angle of doctor’s blade setting, cylinder making process, screen ruling, cylinder size. These parameters were set as follows: temperature: 31°C, humidity: 75%, gravure speed: 17MPM, screen ruling: 150LPI, angle of doctor’s blade: 30°, process: Electro-mechanical engraved, heating: 70°C-80°C, pressure of rubber roller: 2.5 kg/cm² (for each unit), pressure of doctor’s blade: 1kg/cm² (for each unit), cylinder size: 325x500mm. The objective of our study was not to study the effect of these parameters on the results, but to check that the print and reprint conditions were the same, so that the changes reported are not due to change in the parameters. We did our best to maintain the same conditions for the printing and reprinting process.

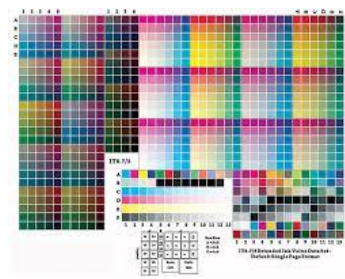


Fig.1.IT8.7/3 Color Chart

The reference image was printed on blister foils with CMYK colors, next a set of samples from the printed image were analyzed. A digital camera (Sony alpha 350) was used to capture an image of each print sample selected to get the reprint samples. The set of printed and reprinted samples analyzed in this study were measured with the Gretagmacbeth Spectroscan. The spectrum and L*a*b* values of the samples were obtained from this device.

To analyze the effect of the scan and reprint process on spectral and color values, in comparison to the original printed artwork, and also to analyze the effect of different printers, only few CMYK color print and reprint samples printed with different printers have been used. Root mean square error (RMSE) was used to analyze the inequality between reflectance spectrums in the visible domain for different printers.

$$RMSE_k = \sqrt{\frac{\sum_{i=1}^n (R_r(\lambda_i) - R_t(\lambda_i))^2}{n}}$$

Where $R_r(\lambda_i)$ is the measured original (reference) spectral data at the wavelength and $R_t(\lambda_i)$ is the tested spectral data at wavelength λ_i . k is the index of the color domain (R, G or B)

considered. Reflectance spectrums of solid colors (Cyan, Magenta, and Yellow) were split into R, G and B ranges of visible spectrum and then standard deviation was used to compute statistically the inequality of spectrums of print and reprint samples for different printers.

The Goodness of Fit Coefficient (GFC) was also used to measure the inequality between original and tested spectral data.

$$GFC = \frac{|\sum R_r(\lambda_i)R_t(\lambda_i)|}{\sqrt{|\sum [R_r(\lambda_i)]^2|} \sqrt{|\sum [R_t(\lambda_i)]^2|}}$$

Where $R_r(\lambda_i)$ is the measured original (reference) spectral data at the wavelength and $R_t(\lambda_i)$ is the tested spectral data at wavelength λ_i . $GFC > 0.999$ and $GFC > 0.9999$ are required for respectively good and excellent spectral matches, respectively.

The Spectral Angle Mapper (SAM) was also used to measure the inequality between original and tested spectral data. The SAM, also known as vector-included angle cosine method, assesses similarity by computing the angle between two spectral data sets in a n-dimensional space, as follow:

$$\begin{aligned} \alpha &= \text{Cos}^{-1}\left(\frac{R_r \cdot R_t}{|R_r| |R_t|}\right) \\ &= \text{Cos}^{-1}\left(\frac{\sum_{i=1}^n R_r(\lambda_i)R_t(\lambda_i)}{\sqrt{\sum_{i=1}^n R_r(\lambda_i)R_r(\lambda_i)} \sqrt{\sum_{i=1}^n R_t(\lambda_i)R_t(\lambda_i)}}\right) \end{aligned}$$

Where n is the spectral range, R_r and R_t refer to the measured original (reference) spectral data and to the tested spectral data, respectively, and α refers to the spectral angle. The higher the SAM value, the lower the similarity of the two spectral vectors [12], SAM values vary in the range [0, 1].

Lastly, the color difference formula ΔE_{00} was used to assess if color differences [13] between original (print) and tested (reprint) are noticeable, or not, for a human observer.

IV. RESULTS& DISCUSSION

In the following, reflectance spectrums of solid colors (Cyan, Magenta, Yellow and Black) printed on blister foils are compared between printed and reprinted samples (reference vs. test) for three different gravure color printers.

- a) Comparison of reflectance spectrums of Solid Cyan for Printer1, Printer2 & Printer3 (Figures 2 to 4).

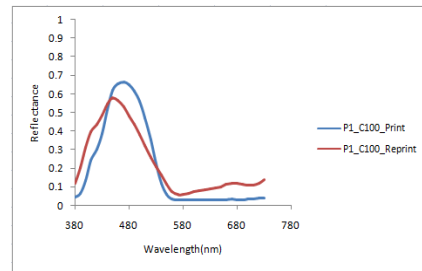


Fig2: Reflectance Spectrum of Solid Cyan for Printer1 (P1)

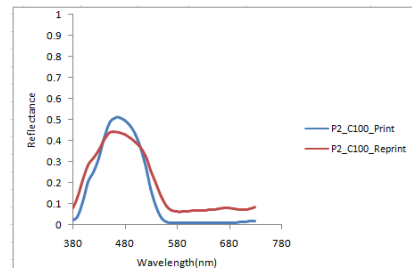


Fig3: Reflectance Spectrum of Solid Cyan for Printer2 (P2)

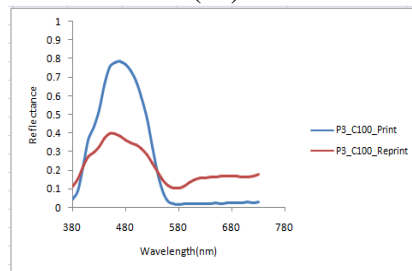


Fig4: Reflectance Spectrum of Solid Cyan for Printer3 (P3)

These spectrums were measured from different printed foil papers and four different positions per foil paper for the same cyan patch. It was observed that the spectrums were similar in nature. It was also observed that the print sample has a blue peak at 470 nm with a higher intensity value than the reprint sample for all printers, and that the peak is a little bit shifted on each reprint. These deviations could be used as a first indicator whether a print is original or not and might be used to identify the original printer used to print the reference sample.

- b) Comparison of reflectance spectrums of Solid Magenta for Printer1, Printer2 & Printer3 (Figures 5 to 7).

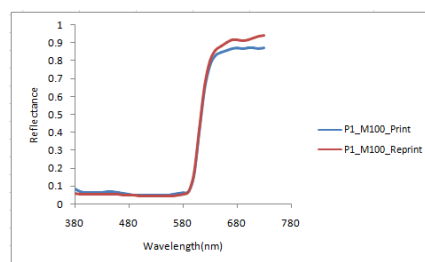


Fig5: Reflectance Spectrum of Solid Magenta for Printer1 (P1)

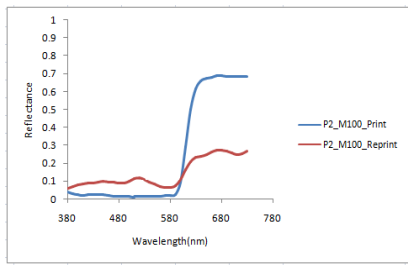


Fig6: Reflectance Spectrum of Solid Magenta for Printer2 (P2)

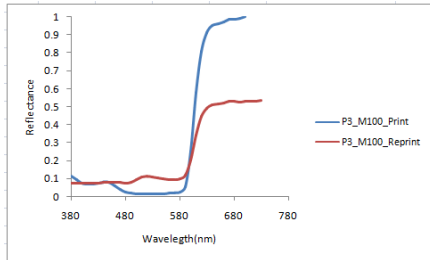


Fig7: Reflectance Spectrum of Solid Magenta for Printer3 (P3)

These spectrums were measured from different printed foil papers and four different positions per foil paper for the same magenta patch. It was observed that the spectrums were similar in nature only for printer P1. Meanwhile, for the two other printers (P2 & P3), in the red region, the intensity value of the magenta color for print is higher than for the reprint. Even if this spectrum shift can be modeled, none color post-processing can be applied after the scanning process to compensate it properly. Our assumption is that while grabbing the magenta patch through the image acquisition device, its color changed (shifted a little bit). These deviations could be used as a second indicator whether a print is original or not and might be used to identify the original printer used to print the reference sample.

- c) Comparison of reflectance spectrums of Solid Yellow for Printer1, Printer2 & Printer3 (Figures 8 to 10).

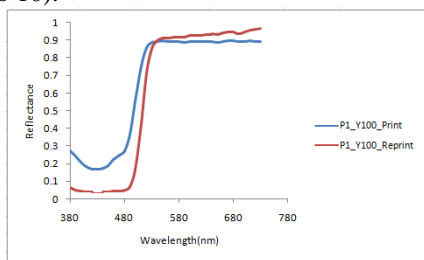


Fig8: Reflectance Spectrum of Solid Yellow for Printer1 (P1)

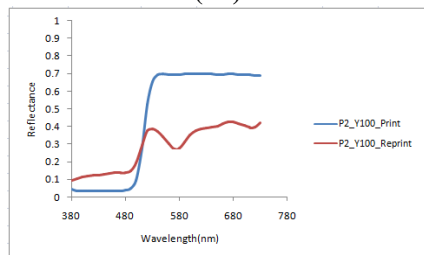


Fig9: Reflectance Spectrum of Solid Yellow for Printer2 (P2)

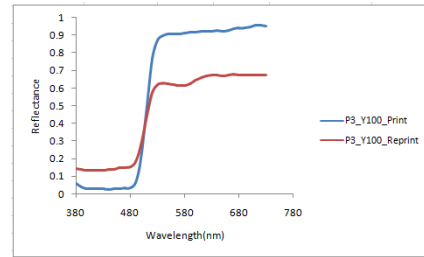


Fig10: Reflectance Spectrum of Solid Yellow for Printer3 (P3)

Once again these spectrums were measured from different printed foil papers and four different positions per foil paper for the same yellow patch. It was observed that for printers P1 & P3, the overall shape of the spectral curve for print and reprint yellow samples is similar, meanwhile for printer P2 the curves are rather dissimilar. On the other hand, for printers P2 & P3, in the green region, the intensity value of the yellow color of the print is higher than for the reprint. One again this cannot be compensated by any color post processing. These deviations could be used as a third indicator whether a print is original or not and might be used to identify the original printer used to print the reference sample.

- d) Comparison of reflectance spectrums of Solid Black for Printer1, Printer2 & Printer3 (Figures 11 to 13).

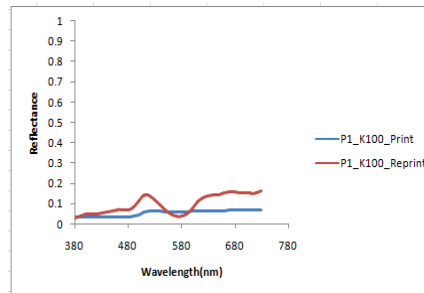


Fig11: Reflectance Spectrum of Solid Black for Printer1 (P1)

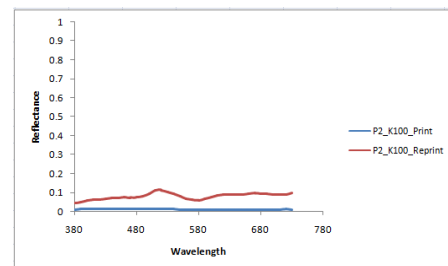


Fig12: Reflectance Spectrum of Solid Black for Printer2 (P2)

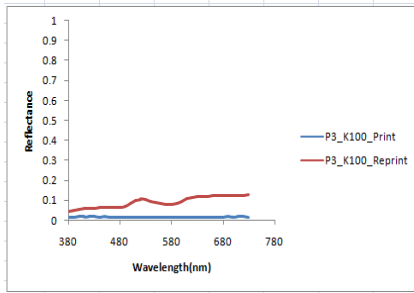


Fig13: Reflectance Spectrum of Solid Black for Printer3 (P3)

Once again these spectrums were measured from different printed foil papers and four different positions per foil paper for the same black patch. It was observed that for all printers, the shape of the spectral curve for print black samples is more homogeneous than for the reprint. Moreover, for all printers, in the red and blue regions, the intensity value of the black color of the print is a little bit higher than for the reprint. On the other hand, for printer P1, the curves are rather dissimilar. One again this cannot be compensated by any color post processing. These deviations could be used as a fourth indicator whether a print is original or not and might be used to identify the original printer used to print the reference sample.

From the spectral representations of C, M, Y and K inks, it was showed that the unique nature of spectrum of reference samples can be used to identify authentic printed samples and also help to recognize the original printer by which original samples were printed.

- e) Comparison of ΔE_{00} values of Solid colors for Printer1, Printer2 & Printer3 (Table I).

Most of spectral differences observed in previous plots correspond to noticeable color differences for human observers (i.e. to $\Delta E_{00} > 2$), except for solid color Magenta for Printer 1, see corresponding spectral curves differences in Figure 5.

TableI: ΔE_{00} (Color Difference) of reflectance spectrum of solid C, M, Y, Kinks (100% of surface coverage) for three different printers between print and reprint. Lowest significant ΔE_{00} are surrounded by cell.

Color Difference	P1				P2				P3			
	C	M	Y	K	C	M	Y	K	C	M	Y	K
Between Print & Reprint Samples ΔE_{00}	2.84	1.12	8.61	7.76	9.57	19.52	21.22	18.49	11.84	10.66	9.76	18.45

- f) Comparison of RMSE values of Solid colors for Printer1, Printer2 & Printer3 (Table II).

As report above, most of spectral differences observed in previous plots correspond to noticeable color differences.

The main exception is for the Magenta color for Printer P1 for which the RMSE values are all lower than 0.045 in R, G and B regions. For the Black color and Printer 1, only two RMSE values are lower than 0.045 (for R and B regions), meanwhile the ΔE_{00} value is equal to 7.76, that means that the color difference corresponding to this spectral difference is visually noticeable. Likewise, for Magenta color and Printer 3, and for Black Printer 3, only one RMSE value is lower than 0.045 (for B region), meanwhile the ΔE_{00} value is equal to 10.66 and 18.45 respectively, that means that the color differences corresponding to these spectral differences are visually noticeable. The RMSE values reported in Table II (and in Figures 14 to 17 below) confirm the observations done in previous sections based on the analysis of reflectance spectrum curves.

TableII: RMSE (Root Mean Square Error) of reflectance spectrum of solid C, M, Y, K inks (100% of surface coverage) for three different printers between print and reprint. Highest RMSE values are in bold. Lowest significant RMSE values (i.e. lower than 0.045) are surrounded by cell.

RMSE	P1				P2				P3			
	C	M	Y	K	C	M	Y	K	C	M	Y	K
Spectrum Region	100	100	100	100	100	100	100	100	100	100	100	100
Blue (380-490)nm	0.128	0.013	0.186	0.027	0.067	0.065	0.089	0.055	0.275	0.029	0.108	0.043
Green (500-610)nm	0.082	0.006	0.159	0.046	0.068	0.073	0.317	0.075	0.163	0.081	0.248	0.075
Red (620-750)nm	0.075	0.045	0.050	0.080	0.062	0.395	0.293	0.081	0.140	0.439	0.264	0.104

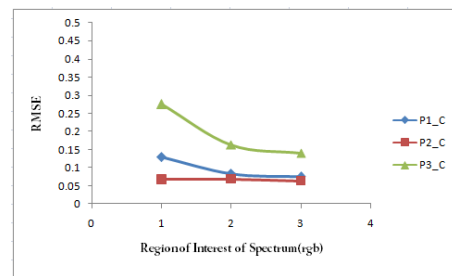


Fig14: RMSE values of Solid Cyan in R, G, B regions for printers P1, P2 and P3

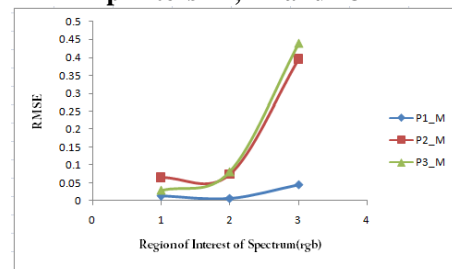


Fig15: RMSE values of Solid Magenta in R, G, B regions for printers P1, P2 and P3

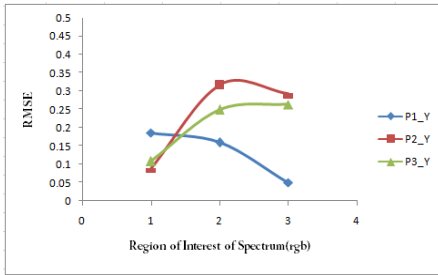


Fig16: RMSE values of Solid Yellow in R, G, B regions for printers P1, P2 and P3

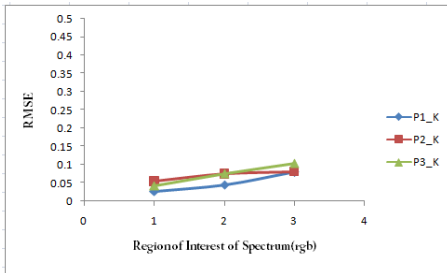


Fig17: RMSE values of Solid Black in R, G, B regions for printers P1, P2 and P3

All observations reported above can be also observed in Figures 18 to 21. These graphs summarize, for the three different printers used, the inequality of errors between reference (print) and test (reprint) samples for different color regions. For cyan ink printed on blister foil, RMSE values are higher at blue range (380nm to 490nm) than for green (500nm to 600nm) and red (610 to 730nm) ranges. For Magenta ink RMSE values are higher for red range for P1 and P2 printers than for the two other regions. No significant tendency can be drawn for Yellow and Black inks.

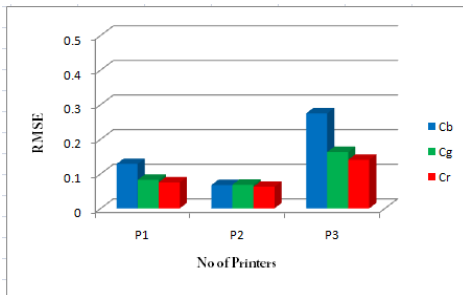


Fig18: RMSE values of Solid Cyan (between reference and test samples) for the three Printers

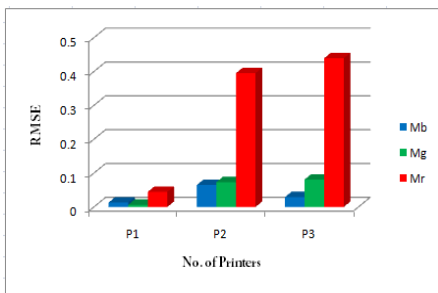


Fig19: RMSE values of Solid Magenta (between reference and test samples) for the three Printers

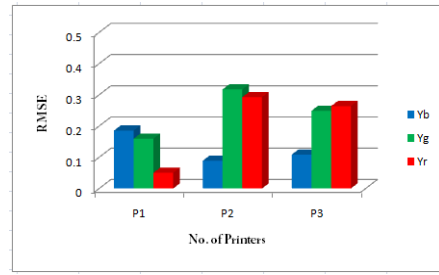


Fig20: RMSE values of Solid Yellow (between reference and test samples) for the three Printers

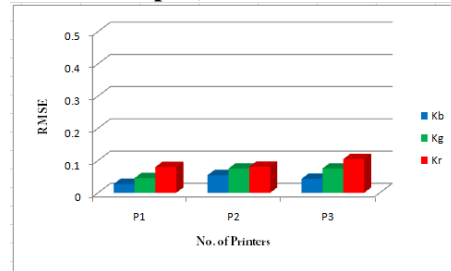


Fig21: RMSE values of Solid Black (between reference and test samples) for the three Printers

g) Comparison of GFC values of Solid colors for Printer1, Printer2 & Printer3 (Table 3).

In this study, we also studied and compared the Goodness-of-Fit Coefficient (GFC) values between print and reprint samples, for the blue, green and red regions of the visible domain, and for the three different printers used. The highest GFC values (higher than 0.995), for R, G and B regions, are for the solid color Magenta for Printer 1. As the corresponding color difference is acceptable for human observers, we could assume that GFC values higher than 0.995 correspond to non-significant spectral differences. Results shown in Table 3 are not all coherent with results report in Table 2, for example RMSE value for K color and Printer 3 is acceptable for B region but the opposite happens for GFC, inversely RMSE values for K color and Printer 3 are significant for G and B regions but the opposite happens for GFC. Likewise, results report in Table 3 is not all coherent with Figures 2 to 13. Therefore, to analyze print and reprint samples, RMSE values should be used preferably to GFC values.

TableIII: GFC (Goodness-of-Fit Coefficient) of reflectance spectrum of solid C, M, Y, Kinks (100% of surface coverage) for three different printers between print and reprint. Lowest GFC values (i.e. lower than 0.995) are in bold. Highest GFC values (i.e. higher than 0.995, means good match between spectral curves) are surrounded by shaded cell.

GFC	P1				P2				P3			
Blue Spectru (380-490 nm) Region	C100	M100	Y100	K100	C100	M100	Y100	K 100	C100	M100	Y100	K100
	0.9617	0.9967	0.9949	0.9717	0.9832	0.9187	0.9863	0.9896	0.9799	0.9234	0.9664	0.9907

Red (620-730) nm	Green (500-610) nm
0.9966	0.9706
0.9999	0.9961
0.9999	0.9826
0.9972	0.9057
0.9888	0.9537
0.9977	0.7073
0.9993	0.9659
0.9985	0.9802
0.9929	0.9168
0.9998	0.7219
0.9999	0.9959

printer has been also studied. We assume that the shape of each spectral curve is unique for each specific ink/substrate combination. Hence if a print is scanned and reprinted, it can easily demonstrate whether it was printed by an original printer or not. It has been also shown that between print and reprinted samples, the RMSE (Root mean square error) values are different for different printers, especially in the red (380nm-490nm), green (500nm-600nm) and blue (610nm-730nm) regions of the visible domain. Hence, RMSE (Root mean square error) between print and reprinted samples can be used to authenticate the printer used among different printers. Other spectral or color difference metrics could be also used additionally to the RMSE metric used, but for this preliminary study RMSE of spectral differences was sufficient to identify the original printer.

h) Comparison of SAM values of Solid colors for Printer1, Printer2 & Printer3 (TableIV).

In this study, we also studied and compared the Spectral Angle Mapper (SAM) values between print and reprint samples, for the blue, green and red regions of the visible domain, and for the three different printers used. The lowest SAM values (lower than 0.1), for R, G and B regions, are for the solid color Magenta for Printer 1. As the corresponding color difference is acceptable for human observers, we could assume that SAM values lower than 0.1 correspond to non-significant spectral differences. Results shown in Table IV are not all coherent with results report in Table II, for example RMSE value for K color and Printer 3 is acceptable for B region but the opposite happens for SAM, inversely RMSE values for K color and Printer 3 are significant for G and B regions but the opposite happens for SAM. Likewise, results report in Table IV is not all coherent with Figures 2 to 13. Therefore, to analyze print and reprint samples, RMSE values should be used preferably to SAM values.

TableIV: SAM (Spectral Angle Mapper) of reflectance spectrum of solid C, M, Y, Kinks (100% of surface coverage) for three different printers between print and reprint. Highest SAM values (i.e. lower than 0.1) are surrounded by cell.

SAM	P1	P2	P3
Red (620-730) nm	0.0075	0.153	0.119
Green (500-610) nm	0.049	0.314	0.451
Blue (380-490) nm	0.081	0.183	0.201
Cyan	0.100	0.857	0.583
Magenta	0.100	0.406	0.394
Yellow	0.101	0.166	0.260
Black	0.238	0.144	0.137
	0.438	0.100	0.100

V. CONCLUSION

By using the spectral curves of CMYK colors, it has been shown that the spectral curves of cyan, magenta, yellow and black inks printed and reprinted on blister foils are different for different printers. When a printed sample is scanned and reprinted by same output device, the spectral signature of the reprint differs from the original print. This property has been used to identify the original printer. In this study, the shape of spectral curves of few color inks printed and reprinted by different printers has been studied. The shape of spectral curves of few color inks printed and reprinted with same

Future work is required to test the robustness of the proposed threshold values from more print and reprint samples, and to develop an accurate model to identify authentic devices among other devices used to create counterfeited samples.

ACKNOWLEDGMENT

The authors would like to express their cordial thanks to indo-french centre for the promotion of advanced research (ifcpar/cefipra) for funding and also grateful to sergusa solutions pvt. ltd. for providing printing facilities to carry this work.

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The Microstructure of Ceramic Materials Formed By Combustion Synthesis and the Effect of Reactant Compositions

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Abstract

Ceramics have been attractive as advance materials for high temperature applications due to their advantages such as high modulus, high hardness, high melting temperature, and high corrosion resistance. Of a broad range of ceramics, titanium carbide and aluminide have developed into one of the most interesting ceramics since they have high strength and good wear resistance at elevated ceramic materials. Producing TiC-Al₂O₃ from economical material (TiO₂) is less expensive than that from their elemental powders. The combustion synthesis (CS) process offers significant advantages to fabricate TiC-Al₂O₃ since it produces high exothermic reaction and takes a short processing time. The objective of this study was to explore the combustion synthesis of TiC-Al₂O₃ and investigate the effect of reactant compositions on the combustion process and microstructure of synthesized products. The combustion synthesis was carried out in a combustion chamber with an atmospheric condition. The ignition technique to initiate the CS was performed using an arc flame. The microstructure and mechanical properties of synthesized products were observed. The result of this research would benefit for producing a high performance ceramic material obtained from economical material with an efficient process.

Key words

Ceramics, Combustion, Microstructure, Synthesis

I. INTRODUCTION

Ceramic materials such as TiC, TiB₂, WC, SiC, and Al₂O₃ have sparked a lot of interest as strong protective coatings in a variety of industrial applications due to their great hardness and wear resistance. [1] [2] [3] [4]. Due to its high modulus, high hardness, high melting temperature, and strong corrosion resistance, titanium carbide has emerged as the most fascinating ceramic for high temperature applications. [3]. Single phase ceramics, on the other hand, have a restricted applicability in high temperatures due to their weak fracture toughness. As a result, the TiC particle has been extensively studied as a possibility for usage in the reinforcing phase of a variety of composite materials, including metallic matrix composites [5], intermetallic matrix composites [6,], and ceramic matrix composites . Because of their great hardness and low density, alumina ceramic systems such as TiC-Al₂O₃ have also been frequently used in high temperature applications [7]. It was also discovered that binary TiC-Al₂O₃ ceramic composites might increase the fracture toughness of individual TiC or Al₂O₃ ceramic materials. [8]. The fracture toughness of ternary ceramic composites was shown to be greater than that of binary ceramic composites, according to further research [9]. The addition of 10% ZrO₂ to Al₂O₃-TiC synthesized from TiO₂, Al, and C by combustion synthesis and hot pressing increased the fracture toughness of Al₂O₃-TiC-10 wt. percent ZrO₂ by roughly 20% compared to Al₂O₃-TiC composite [10].

II. LITERATURE STUDY

As part of this study's references, there are a few literatures. These are the ceramic material and combustion synthesis studies. Due to its high modulus, high hardness, high melting temperature, and strong corrosion resistance, titanium carbide has emerged as the most fascinating ceramic for high temperature applications. A green compact, or simply a green, is the work portion that has been compacted but has not yet been entirely processed.

The reactant is pictured as being made up of a huge number of dense, spherical granules. During synthesis, reducing the effects of gravity can prevent the segregation of phases with differing densities. In thermite-type systems, certain tests have been carried out in Lear jet planes to generate thick ceramic-metal composites (e.g., TiC-Al₂O₃-Al₁T iB₂-Al₂O₃-Al₁Z, rB₂-Al₂O₃-Al₁,B₄CA₁Al₂O₃-Al₁).

A. Ceramics

Ceramics are described as a class of inorganic, nonmetallic solids that are manufactured and/or used at high temperatures[11]. Oxides, carbides, and nitrides are the most prevalent ceramic materials. Ceramics are also made with silicides, borides, phosphides, tellurides, and selenides. High temperatures are used in ceramic production, and the resultant materials are heat resistant or refractory.

Natural clays are heated to a high temperature to make ceramics. Red clay, which includes predominantly silicon dioxide and iron oxide, and kaolin clay, which contains

largely aluminum oxide and practically little iron oxide, are the two most common forms of ceramic clay. Red clay has a rusty brown color that ranges from light tan to dark brown because it includes more iron, whereas pure kaolin clay is white.

A. Combustion Synthesis

Combustion synthesis is a method of synthesizing materials that requires extremely exothermic chemical interactions between metals and nonmetals, as well as a metathetical (exchange) reaction between reactive chemicals or reactions involving compounds/mixtures [12].

Self-Propagating High Temperature Synthesis (SHS) and Volume Combustion Synthesis (VCS) are the two types of combustion synthesis. Reactants can be squeezed into a pellet in either situation, which is generally cylindrical in form. The samples are subsequently heated either locally (SHS) or uniformly (VCS) by an external source (e.g., tungsten coil, laser) to induce an exothermic process.

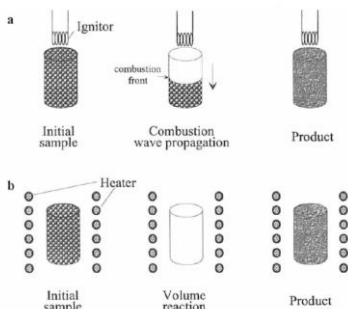


Figure 1 a) SHS Illustrations b) VCS Illustrations

B. Ignition Techniques

Figure 2 depicts the ECAS procedure conceptually. It consolidates powders or synthesizes and densifies specified products with appropriate configuration and density while concurrently applying an electric current and mechanical pressure. During the sintering cycle, the applied electric current and mechanical load may remain constant or fluctuate according on the specified densification phases. An automated controller, in instance, may change the current such that a predetermined temperature cycle is followed.

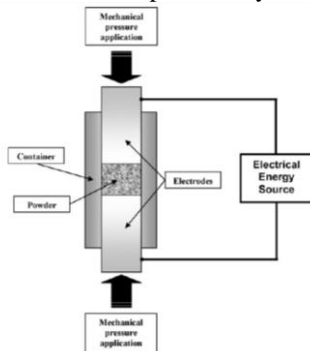


Figure 2 ECAS Scheme

C. Green Mixture Density

To produce the necessary shape, a mixture of powder materials is crushed into dies under high pressure. A green compact, or simply a green, is the work portion that has been compacted but has not yet been entirely processed. [13].

The density of the portion, known as the green density, is substantially higher than the initial material density as a result of compaction, but it is not uniform in the green density. [13] From the bulk gas stream reaches the pellet surface, reactant gas undergoes mass transfer. For the reaction to take place, the gas must permeate from the surface to a sharp contact between the grain particle and the product layer. [14].

D. Grain Size of Powder

Many aspects of particulate materials are influenced by grain size, which is a useful measure of quality and performance. Powders, suspensions, emulsions, and aerosols all fall within this category. Powder size and form have an impact on flow and compaction qualities. Smaller particles dissolve more quickly than bigger ones, resulting in greater suspension viscosities. Suspension and emulsion stability are often improved by smaller droplet sizes and increased surface charge (zeta potential).

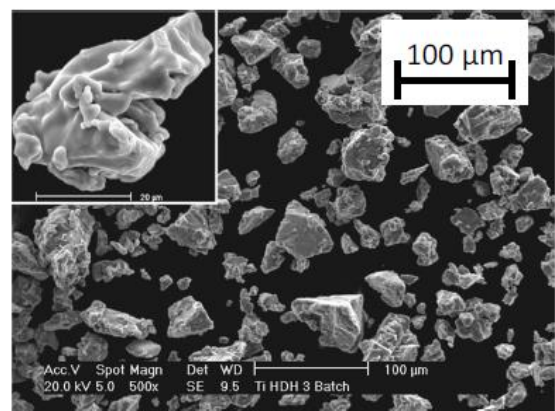
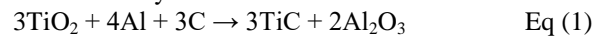


Figure 3 Ti Powder grain size

III. METHODS

Powder was chosen as the reactant in this study because it allows for the creation of complicated product geometries and allows for "near net shape" formation, which eliminates the need for machining procedures. [15]. Aluminium (Al), titanium oxide (TiO₂), carbon black (C), and alumina particles were employed in this study (Al₂O₃). The use of titanium dioxide (TiO₂) to obtain TiC indirectly is advantageous since it is less costly than using elemental Ti powder [16]. Furthermore, TiO₂ has a low volatile organic compound (VOC) content, allowing it to meet global environmental standards.

The mass fraction of each element in the chemical reaction in Eq. 1 is used to weigh the reactant powders utilized in the combustion synthesis.



The mixes were then combined after being weighted according to the chemical reaction described in Eq. (1). The basic goal of powder mixing is to create a combination that is as homogeneous as possible, because mixture homogeneity has a substantial impact on the product's microstructure and qualities. Crushing roughly 50 grams of reactants in a ceramic mortar for around 20 minutes is used to combine the reactants.

The balancing procedure determines the weight of powder materials that will be manufactured. It was calculated using a chemical process with a total of 1 gram of reactants.

IV. RESULTS.

The result of XRD in pure sample material without any extra addition of stoichiometric compositions is known as an XRD pure material result.

There are just two TiC found by XRD tests, which are at around 45 in theta with 5 in intensity or counts and 80 in theta with 8 in counts, according to the XRD pattern of pure material. Meanwhile, Al₂O₃ is discovered as 6 spots in 2 theta, namely 31, 37, 39, 45, 60, and 85.

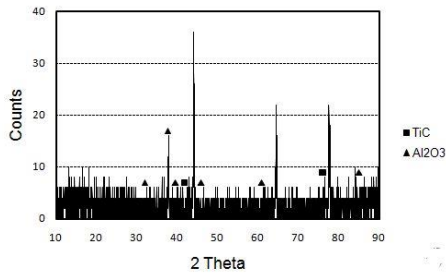


Figure 4. XRD Pattern without Excess

Meanwhile, Al₂O₃ is discovered as 6 spots in 2 theta, namely 31, 37, 39, 45, 60, and 85. It can be seen that TiC with a 20% excess of TiO₂ and C has risen from one point to three, at 35, 41, and 72 theta, respectively. This sample has seven Al₂O₃ molecules. In 2 theta, they're at 19, 31, 37, 45, 60, 67, and 87, with intensities of 9, 5, 23, 7, 7, 4, and 7.

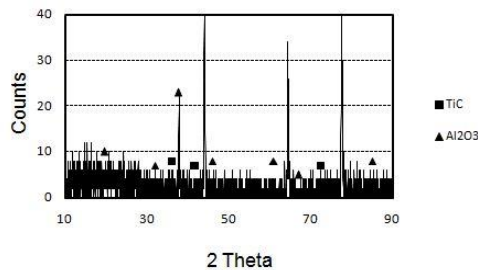


Figure 5. XRD Pattern with 20 % Excess

This is last sample which is tested by XRD, 40 % excess of TiO₂ and C. Basically, for the 3rd experimental, it has almost same theta with the 2nd experiment but it has additional TiC detected at 60 and 78 in 2 theta.

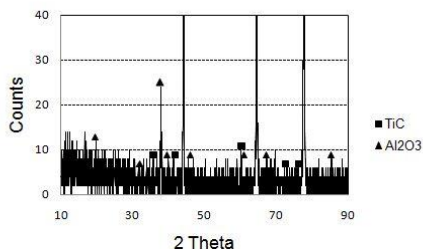


Figure 6. XRD Pattern With 40% Excess

Microstructures

The particle appears to be diverse in terms of form and size. Some particles have a denrite-like shape, whereas others have

a cubic shape. The Differences of Microstructures can be seen in Figure 7 to 9.

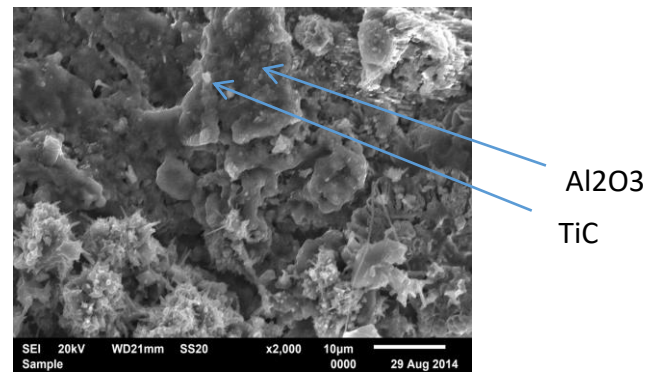


Figure 7. SEM Figure of Without Excess Synthesized Product

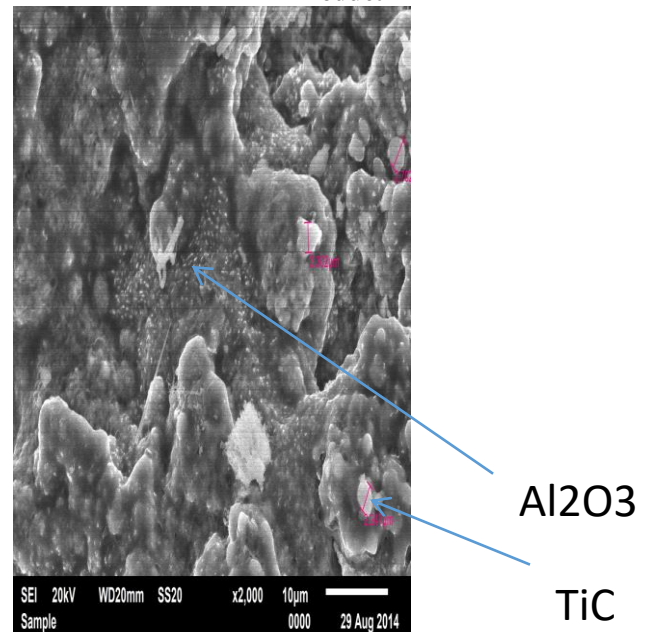


Figure 8. SEM Figure of With 20 % Excess

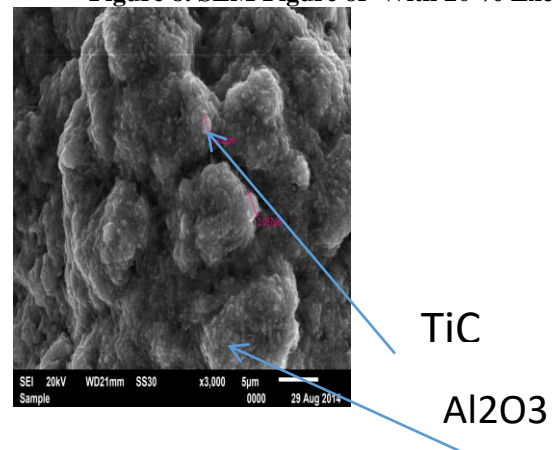


Figure 9. SEM Figure of With 20 % Excess

V. CONCLUSIONS

The use of combustion synthesis to produce ceramic material proved successful. The ignition and flame propagation have been modified by the reactant composition. SEM and XRD may be used to determine the phase composition of the

produced product. The presence of Al₂O₃ can be observed clearly in the XRD pattern. However, the XRD spectra of titanium carbide (TiC), a result of the combustion process, are missing. The porosity of the reacted product shows the influence of reactant composition on the microstructure of the synthesized product, with increasing amount of TiO₂ and C resulting in increased porosity. The growing TiO₂ and C content can also be seen in the XRD pattern. The greater the peak result on the XRD test, the more extra addition there is. SEM test is also suggested to make sure the composition of synthesized product.

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Investment Cost Analysis of the Developed Hand Tractor Driven Onion Harvester

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Abstract

In the Philippines, manual harvesting of onion is still a practice. For this reason, an onion harvester that is adaptable to local field conditions developed. However, the technical design must be with economic viability to guide the farmers in making accurate decisions for investment. Thus, the study of calculating the payback period (PP), break-even point (BEP), benefit/cost ratio (BCR), and comparing the cost of manual and mechanical harvesting conceptualized. Based on the results, the recovery of investment cost or PP is 2.03 years; the break-even point is at 4.86 ha/yr, and the BCR is feasible at 2.19. When comparing mechanical and manual harvesting, the former requires a labor of 10 man-day/ha and a cost of PhP4,419.50/ha. The latter of 23 man-day/ha and PhP8,156.95/ha, respectively. The reduction of 13man-day/ha and PhP3,737.45/ha implies a significant advantage when using the machine. Thus, utilizing the cost-effective onion harvester could increase the profitability and productivity of farmers.

Key words

Agricultural machinery, hand tractor, investment analysis, onion harvester

I. INTRODUCTION

Investments in agricultural machinery increase the farm power supply; thereby, more tasks are timely completed, and more areas are cultivated. Purposely, to produce larger quantities of crops while conserving natural resources. However, investing in agricultural machinery cannot ensure such results without additional measures. It requires a minimum condition to adhere to and ensure efficient mechanization. These are suitability to small farms, simple design and technology, and affordability [6]. In the Philippines, where farmers have average landholdings of 1.29 hectares/farmer [9], it needs to prioritize agricultural machinery suited to small farms for sustainable utilization and productivity.

The mechanization level in the country is low at 1.23 hp/ha [3]. Increasing this current level of mechanization does not necessarily mean costly investments in tractors in other machinery [7]. It must be on providing the needs of farmers effectively and efficiently; more importantly, the drudgery reduction associated with manual labor is the key element of sustainable mechanization accessing appropriate forms of farm power. This goal is anchored to the development of small machines/equipment that is affordable and adaptable to local field conditions.

The affordability of machines should not only be limited to the farmer's purchasing ability. Farmers also need to be educated as investment decisions are one of the most significant farm management decisions they have to take [2]. Purchasing a piece of machinery requires precise estimation of the associated costs (annual ownership and operating cost) [8]. Making a smart decision can reduce machinery costs as

much as PhP6,898.70/ha [5]. This significant decrease in machinery cost to small farmers in the Philippines could salvage profit and inaccurate investments. Thus, prioritizing machinery development covering investment analysis is the key for effective machinery management and sustainable machinery utilization [1].

The developed onion harvester is a hand tractor implement designed to adapt to the local field conditions. Specifically, to sustainably utilize the locally designed hand tractors not just for land preparation and transportation but also for other operations on the farm. Thereby, reducing the cost of investing in another power source to operate the machine. A farmer with high farm power beyond the requirement diminishes the profit returns and prolongs the investment recovery. Hence, to assist local farmers in investing in this developed onion harvester, this study of investment cost analysis was conceptualized. Specifically, to calculate the investment cost parameters of break-even point, payback period, and benefit/cost ratio. And to compare the cost of manual and mechanical harvesting using the hand tractor-driven onion harvester. Disclosing this information to farmers helps make smart decisions in selecting the accurate size of the machinery. Purposely, to considerably decrease the farming expenditures, thereby realizing more income and increased quality of work.

II. MATERIALS AND METHODS

A. Research Design

This study adopted the descriptive research design to attain the specific practices in the local onion industry, particularly in the harvesting operation. It focused on the cost comparison using manual and the developed onion harvester. In realizing

the impact of the study, the calculations of economic measures adapted the equations based on standards.

B. Investment Cost Analysis

The three (3) parameters of investment analysis were used to determine the economic feasibility of the machine. These are the break-even point analysis, payback period, and benefit/cost ratio.

The investment cost of the hand tractor was not considered in the calculation. However, the tractor cost or the cost of operation was calculated as variable cost; since the onion harvester is driven by the hand tractor.

C. Break-Even Point Analysis

The break-even analysis indicates a point where there is just sufficient revenue to cover the costs. It is a point at which the total cost and the total gross revenue intersect or the Break-Even Point (BEP). The BEP is a point at which neither profit nor loss is made and known. Equations (1), (2), (3), (4), (5), (6), (7), (8), (9) were used for the calculation of BEP.

$$IC = COM + L \tag{1}$$

$$SV = 10\%IC \tag{2}$$

$$D = \frac{IC - SV}{n} \tag{3}$$

$$FC = D + I + TIS \tag{4}$$

$$VC = Cp + Cl + RM + Clu + Ct \tag{5}$$

$$THC = FC + VC \tag{6}$$

$$HC = \frac{VC}{C} \cdot T \tag{7}$$

$$BEP = \frac{FC}{Cr} - Bc \tag{8}$$

$$ANI = C' \cdot T' (Cr - Tc) \tag{9}$$

Where: *IC* - investment cost of the machine, PhP;

COM - total cost of the materials;

L - cost of labor of fabrication, PhP;

SV - salvage value of investment cost, PhP

D - depreciation, PhP/yr;

n - life span, years;

FC - annual fixed cost, PhP/yr;

I - interest on investment, PhP/yr;

TIS - taxes, insurance, and shelter, PhP/yr;

VC - variable cost, PhP/yr;

Cp - fuel cost, PhP/yr;

Cl - labor cost PhP/yr;

RM - repair and maintenance cost, PhP/yr;

Clu - lubricant cost, PhP/yr;

Ct - tractor cost, PhP/yr;

THC - total harvesting cost, PhP/ha;

HC - harvesting cost, PhP/ha;

C - harvesting capacity, ha/hr;

T - annual operating time, hrs/yr;

BEP - number of hectares the machine will operate to recover the IC, ha

Cr - custom rate, PhP/ha;

ANI - annual net income, PhP/yr; and

Tc - annual cost, PhP/yr

D. Payback Period

The payback period (PP) indicates the length of time it will take for the investment to be recovered or the required number of years for cash inflows and cash outflows to be just equal. It is also called simple payout method that concerns on the liquidity of the project not on the profitability. Equation (10) was used to calculate payback period.

$$PP = IC / ANI \tag{10}$$

Where: *PP* - payback period, years

E. Benefit/Cost Ratio Method

Benefit-cost ratio (BCR) is a ratio of discounted benefits to discounted costs. It is one of the standard procedures accepted for decisions of making go/no-go on investing the onion harvester compared to alternatives. If the value of BCR > 1.0 the investment is feasible. However, if the value of BCR < 1.0, the investment is not recommended. Equations (11), (12), (13) were used to calculate BCR.

$$PWB = AGI(P/A, I\%, N) \tag{11}$$

$$PWC = ATC(P/A, I\%, N) - SV(P/F, I\%, N) \tag{12}$$

$$BCR = PWB / (PWC + IC) \tag{13}$$

Where: *PWB* - present worth benefits, PhP;

AGI - annual gross income, PhP/yr;

I% - interest rate in investment cost, 12%;

N - life span of the project, years;

PWC - present worth costs, PhP; and

ATC - annual total costs, PhP

F. Cost Comparison of Manual Vs. Mechanical Harvesting

The manual harvesting of onion in area/time or ha/hr is actual data gathered during the performance test of the machine. To eliminate bias in data collection, two (2) onion farmers implemented the manual harvesting of onion, and two (2) onion farmers operated the onion harvester. The onions in the 24 experimental plots (10m x 0.5 m/plot) are tapped for both harvesting methods before the start of data collection. The tapping/cutting of onion leaves is on the local market standards.

The average time for manual harvesting was calculated and converted at PhP44.33/hr, the allowable wage for agricultural woks [10]. The fuel consumption of the machine is calculated using the current price of PhP51.70/li [4]. The cost of mechanical harvesting was calculated using the data collected for harvesting capacity and fuel consumption.

III. RESULTS AND DISCUSSION

G. Mechanical Harvesting Using the Onion Harvester

The onion harvester shown in Figure 1 is a hand tractor implement capable of digging, lifting, cleaning, and

collecting onion bulbs in one operation. It is a single row harvester that can be hitched to a locally designed hand tractor with a single forward speed and has no reverse. The parts were made of locally available materials and fabricated by a local manufacturer. It has five (5) main assemblies: the mainframe, digger blade, soil-onion separation device, power transmission system, and discharge cart.

The onion harvester technical parameters involved in the calculation are the harvesting capacity of 0.03 ha/hr or 300 m²/hr and the fuel consumption of 1.35 li/hr.

H. Manual Harvesting

The manual harvesting of onion shown in Figure 2 is the pillar for the development of this study. The result showed that the harvesting capacity of human has a mean of 0.0055 ha/hr or 55 m²/hr shown in Table 1.



Figure 2. Manual harvesting of onion during the machine field performance evaluation

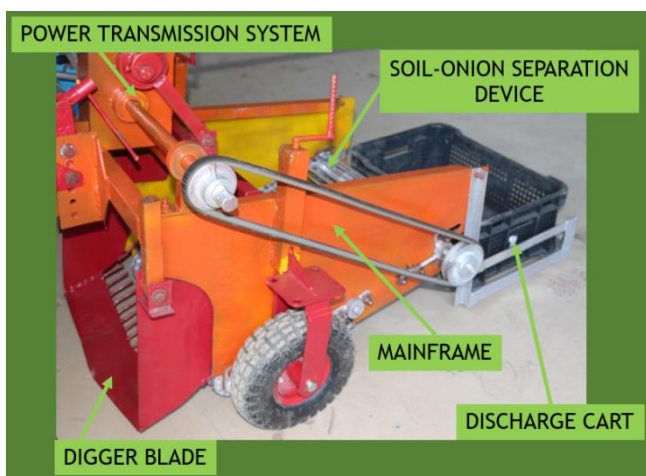


Figure 1. Developed onion harvester implement for hand tractor

Table 1. Manual harvesting capacity of human

Manual Harvesting	Mean of five (5) replications
Farmer 1 (ha/hr)	0.0050
Farmer 2 (ha/hr)	0.0060
Mean	0.0055

I. Investment Cost Analysis

The investment analysis employed the calculation of PP, BEP, and BCR in determining whether the machine is cost-effective in harvesting onions. The assumptions used in the calculation are in Table 2. The investment cost of the onion harvester was PhP32,315.00, covering the total cost of material and fabrication. The annual FC calculated was PhP10,825.53/yr. It is the cost incurred for depreciation with a life span of 5 years; interest on investment; and housing, taxes, and insurance. The total annual VC calculated was PhP174.52. It is the summation of the cost incurred for fuel cost at PhP51.70/li; lubricant cost, repair, and maintenance; labor cost at PhP44.33/hr; and tractor cost. The tractor cost of PhP43.20/hr was included as a variable cost since the onion harvester is an implement; it is power-driven dependent on the hand tractor.

The calculation resulted in an annual cost (14) and (15) and yielded Figure 3 and Table 3. The former shows the break-even point curve (ha/yr); the latter shows the summary of investment analysis of using the machine.

$$Cu = (10,825.53 / A) + 4,419.50 \tag{14}$$

$$AC = 10,825.53 + [(A / 0.03) \cdot 174.52] \tag{15}$$

Table 2: Assumptions in the investment cost analysis of the onion harvester implement

Particulars	Hand tractor	Onion harvester
Purchase Price, PhP	60,000.00	32,315.00
Salvage value, %	10.00	5.00
Years, n	10.00	5.00
Fuel consumption, li/hr		1.35
Fuel price per liter, PhP/li		51.70
Repair and maintenance, % Php/100 hr	1.20	1.00
Rate of interest, %	20.00	20.00
TIS, %	4.00	4.00
Labor cost, PhP/day		354.65
Annual hours, hr/year	400.00	

Capacity, ha/hr		0.030
A. Fixed Cost Items		
Depreciation	5,400.00	6,139.85
Interest on investment	6,600.00	3,393.08
TIS	2,400.00	1,292.60
Total Annual FC, PhP/yr	14,400.00	10,825.53
B. Variable Costs		
Fuel cost		69.80
Lubricant cost		13.96
Repair and maintenance	7.20	3.23
Labor		44.33
Tractor cost	43.20	
Total VC, PhP/hr	174.52	

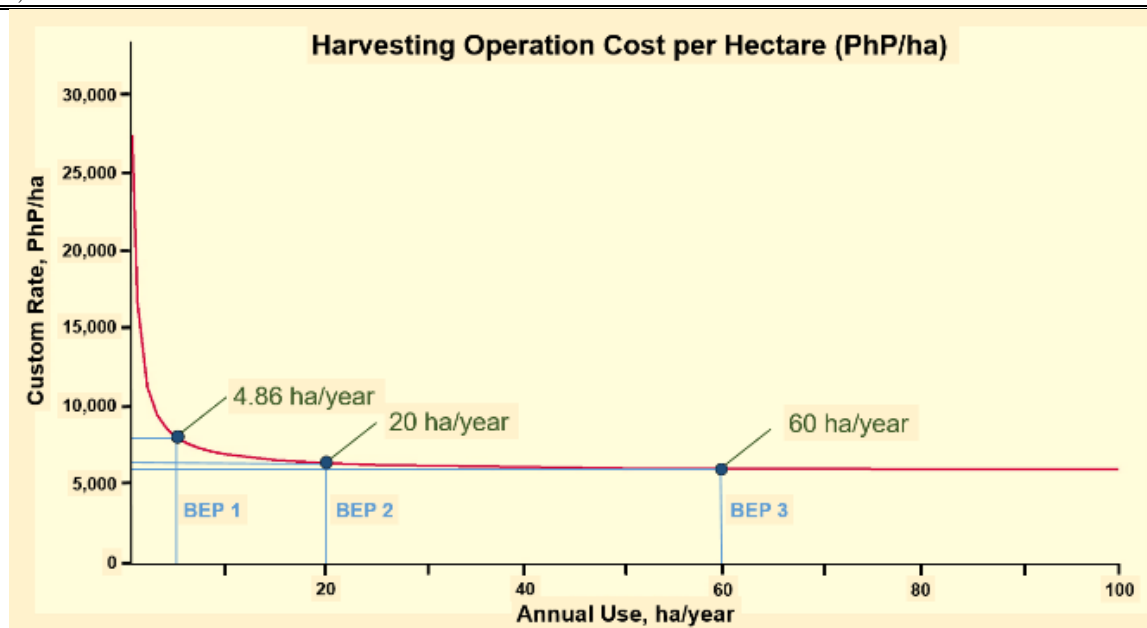


Figure 3. Onion harvester break-even point cost curve

Table 3. Summary of investment cost analysis of the onion harvester

Particulars	Value
Total annual fixed cost, PhP/yr	10,825.53
Total variable cost, Php/yr	174.52
Harvesting cost, PhP/ha	4,419.50
Net income generated, PhP/yr	15,925.18
Break-even point, ha/yr	4.86
Payback period, years	2.03
BCR	2.19

The planting of onion is twice a year. With this, the onion harvester was projected to be in operation for 25 days per cropping season or 400 hours/yr. Calculating using the harvesting capacity of 300 m²/hr, the computed annual capacity is 12 ha/yr. Also, the total harvesting cost is PhP4,419.50/ha; the payback period is 2.03 years, and the profit income is PhP15,925.18/yr.

The custom rate of the machine is assumed to be equal to the manual harvesting capacity at 0.0055 ha/hr, calculated at PhP8,046.45/ha. This yields to a break-even point of 4.86 ha/yr. It signifies that the onion harvester needs to operate at

BEP to recover the gross revenue. As the machine harvests beyond the BEP, it will generate profit. If the farmer does not own the required BEP, it is best to adopt custom hiring or renting the onion harvester. However, if a farmer owns or cultivates higher than 4.86ha/yr; it is best to acquire/invest the onion harvester implement.

J. Cost Comparison of Manual and Mechanical Harvesting of Onion

Due to the high labor and cost requirement of manual harvesting operation of 23 man-day/ha and PhP8,156.95/ha; utilizing the developed onion harvester could reduce these requirements. From the results, the onion harvester requires labor and cost of 10man-day/ha and PhP4,419.50/ha, respectively. The reduction of 13 man-day/ha and PhP3,737.45/ha implies a significant increase in profit to farmers. During the peak season of harvest, where labor is scarce, the use of onion harvester could address this problem.

IV. CONCLUSION

The study conceptualized formulating a scientific approach in determining the economic aspect of the developed onion harvester. With the results, the machine is economically viable. It decreases the labor and cost requirement

eliminating laborious and costly manual operation. Utilizing the machine could increase productivity and profitability in production. Accelerating policy formulation to develop Philippine Agricultural Engineering Standards [PAES] of onion harvester is encouraged. Also, involvement of the Agricultural Machinery Testing and Evaluation Center [AMTEC] performance tests before commercialization.

ACKNOWLEDGEMENT

The researchers acknowledge the contributions of the different stakeholders in the accomplishment of this study. Appreciation is due to Don Mariano Marcos Memorial State University (DMMMSU) for supporting the study, and above all, to Almighty God for letting His blessings overflow.

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Effective Assessment Model to Reduce Risk Management: A Micro Entrepreneur Program

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Abstract

This conceptual paper seeks to analyse how the Context, Input, Process and Product (CIPP) assessment model approach is adopted to give feedback to the organizer when it is time to make the decisions, whether be it to continue, to improve or to end a particular program. The evaluation outcome of a program involves planning, designing, implementing and assessing the effectiveness. The CIPP model approach is chosen because it is a comprehensive model, covering the context, input, process and product. The output assessment in the CIPP Model Development was developed in 1971, and it was even used widely by various parties. Thus, it explained that this model is often used to assess the effectiveness of a training programs. This study uses the CIPP model as an aid for organizers and participants to achieve the objectives of the program, not merely to fulfil individual needs. The CIPP Model is able to demonstrate the implementation outcome of a training program and its effectiveness comprehensively and systematically at the same time reduce risk management. The CIPP model can be implemented in an education entrepreneurs program, particularly to obtain knowledge and information in line with program outcome. This study may assist to demonstrate the implementation outcome of a training program in effective making decisions to assess model to reduce risk management in a micro entrepreneurs training program. Therefore, the comparative analysis between assessment models from this study can be used to identify the needs and importance also the suitability, by fulfilling the aim of the organizer when assessing a program.

Key words

CIPP Model approach, assessment model, micro entrepreneur module, risk management

I. INTRODUCTION

The program assessment using the assessment model approach is an assessment method used to know the extent of a program implemented, whether it needs to be continued, improved or terminated; this is because this process will look into the problems, select information needed, gather and analyze the information to report useful conclusions to decision makers. Thus, the assessment process has to be done more carefully. The assessment process is the most difficult aspect in the assessment models.

The issue of this conceptual paper rests on why the study adopts assessment model (CIPP) 2007. This model was built at the end of 1960 and its discovery in 1966 related to the design of the objectives, tests and testing. Meanwhile, in Stufflebeam's Assessment Model (2003), it emphasized on the role of the researcher in collecting the data and information from the main sources which is directly while the program was conducted. the most important thing in the program assessment is not to change but to improve, and this model even gets to know the responsibilities of a leader and staff in an institution systematically because the effectiveness

of a program is seen from the formative and summative assessment outcome, where this assessment is able to resolve the issues related to the next program implementation.

However, this model was also used for the assessment before, while or after the program was conducted. While other models can only be assessed in a certain time only, for instance the stake model being used only while the program is conducted, Tyler's model⁹ only measures the difference between the behavior of the participants through their changes before and after attending the program, and Kirkpatrick's Assessment Model only assessed whether the goal of the program is achieved or otherwise, and will measure the changes in attitude, the increased knowledge and skills after the training program.¹

Nonetheless, in assessing the program, certainly there is no Model Assessment that is considered perfect and the best, as every Assessment Model has its own strength and weakness. There is no one of the Assessment Models that is the most complete and absolute in an assessment, suggested that in

^[1] Kirkpatrick. D.L. (1994). Evaluating Training Program: The Four Level. San Francisco: Barret-Koehler

assessing a program one needs to know the purpose, design, suitability criteria, past studies, the strength and weakness of the program before choosing the best or the most appropriate Assessment Model.^{2,3}

motivation

Module assessment is an important process to determine whether the program carried out gives positive or negative effects, as the assessment can determine the value of an object⁴ (Vincent, 2010). The assessment of module in micro entrepreneur is always looking at the positive effect in the development of micro entrepreneur, while stressed that the assessment in micro entrepreneur is a process of deciding upon the quality, effectiveness or value for a program, product, project, process, objective or the curriculum.⁵

At the same time, a program must reduce risk in program development because of its inherent uncertainty and should accommodate individual life span and in an organization.⁶

Although, the micro entrepreneur program assessment in this study seeks to evaluate the syllabus, module, activities and process carried out, also to know the extent to which the program is able to fulfil its objectives. The early-stage practice can give a well positive input among the student, as the main focus in this study is to know how far the implementation process of the micro entrepreneur program success is in raising the awareness and knowledge of the micro entrepreneur on the study, so that there will be a change in the mind performance. Thus, in assessing a training program, it is crucial to obtain comprehensive and accurate information from different participants.⁷ The assessment may include the following training module:

Training module

- a- Islamic business management information
- b- Personal financial information management using PFI model.
- c- Company's financial management information
- d- License application information
- e- Marketing information & location determinant
- f- Business account management information & personal account
- g- Client information management
- h- Staff management information
- i- Leadership information
- j- Health and sanitation care information
- k- Business simulation
- l- Monitoring

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[7] Tomlinson, H (2004), *Educational Leadership – personal growth for professional development*, London: Sage Publication.

m-Guidance

Thus, in the assessment of a program, there are various models or approaches used to assess the training program. According to Ibrahim (2001), a model serves as a framework towards the actual condition. It is concise and comprehensive and can be symbolized as a roadmap that helps one to determine his or her direction.

OBJECTIVE

The study aims to investigate the risk in evaluation outcome of a program involves planning, designing, implementing and assessing the effectiveness. However the CIPP model approach is chosen because it is a comprehensive model, covering the context, input, process and product. While this study has found that output assessment in the CIPP Model Development was developed in 1971, and it was even used widely by various parties. Thus, it explained that this model is often used to assess the effectiveness of a training programs. This study uses the CIPP model as an aid for organizers and participants to achieve the objectives of the program, not merely to fulfil individual needs.

I. statement of contribution

The approach of the Assessment Model using CIPP Model can be measured using various model approaches that are appropriate to the study purposes. It even gives different impacts following the model adopted. There are almost 60 types of Assessment Model programs, but the differences lie in several factors which is the study methods and requirements. Meanwhile, there are six assessment approaches with the orientation resting on the types of studies that shares some common features-the purpose of assessment, the method of assessment and the criteria in the models categorized namely:

- a) Objective-oriented approach
- b) Management-oriented approach
- c) Customer-oriented approach
- d) Opponent-oriented approach
- e) Expertise-oriented approach
- f) Naturalistic and participant-oriented approach

In determining the Assessment Model selection, the assessor has to look into the probability of the use of the Assessment Model carefully, because every Assessment Model has its own assessment method and evaluation stage.⁸ Every planning of a program necessitates certain allocation from the sponsor towards achieving a certain target because the best Assessment Model is a model that suits the needs of the assessor.

Effect of selected model to reduce risk management

The successful effect in entrepreneur program depends on selecting a compatible model by having a suitable guideline

[8] Razak, T. M. T. A., Haron, M. S., & Buang, N. A. (2017). How the CIPP model assesses the entrepreneurial education program: From the micro entrepreneurs' perspective. *Turkish Online Journal of Educational Technology*, 2017(November Special Issue INTE), 70-78.

following the listed models in evaluation standard. Upon failure of training model selection can affect the outcome of a product.

A successful entrepreneur depends on the business practice but failure of an entrepreneur program in educating effect the failure of an entrepreneur. According to Farida (2019), relationship between the level of leverage and disclosure of risk has a positive effect. In fact, management in decision making has a major influence of a program.

II. RESULT AND DISCUSSION

In deciding on the most suitable Assessment Model for every study, the assessor needs to understand all approaches of the Assessment Model related to the programs that will be, and have been executed, since every model has its own method, rules and strategies that are suited to the assessment objectives.

Therefore, there are 9 Assessment Model approaches that have been analyzed to know and understand every model to be made compatible with the assessment study that is to be done. Having been analyzed, the assessor gets to know why the CIPP Assessment Model is very suitable with the studies related to the assessment of program effectiveness and achievement. Among the approaches that have been analyzed are as follows:

1. Tyler’s Assessment Model (1949)
2. Hammond’s Assessment Model (1973)
3. Scriven’s Information-Free Assessment Model (1972)
4. CIRO Assessment Model (1970)
5. CIPP Assessment Model (1973-2007)
6. Bell’s Assessment Model (1979)
7. Kirkpatrick’s Assessment Model (1959)
8. Responsive assessment model (1967)
9. Illuminative assessment model (1972)

A Summary of the Comparative Analysis between Assessment Models and CIPP Model

Assessment Model summary, it can be seen that the assessment component in terms of the method, the use, focus and process of assessment have both similarities and differences, but they vary in terms of the purpose and requirement.

Therefore, if we look at it as a whole, the Assessment Models have their own weaknesses and strengths. Having analyzed all the nine models, it is found that the CIPP Assessment Model is a systematic model that assesses comprehensively, and it follows the situation of the assessment. A lot of scholars have been fascinated by it and stated that the CIPP model assessment is easy and accurate in assessing management-oriented programs like agriculture programs, entrepreneurship programs, fishery programs and many more.

If we look at it on the surface, the eight types of Assessment Model only assess a stage. This is because the assessment process is too time-consuming. However, the Assessment Model CIPP proves to be consistently appropriate and assesses the program comprehensively and look into the outcome of the program. However, there is also a similar

model to the CIPP model, which is the CIRO model, where it encompasses the whole aspects, but it only assesses the early stage of the program, how it is implemented and what is the outcome.

Therefore, this summary can be used to identify the needs and importance also the suitability, by fulfilling the aim of the organizer when assessing a program.

Table 1: Comparative analysis between assessment models

No.	Component of Assessment	Method	Use	Focus	Process
1	CIPP (Stufflebeam et al 1971)	*Context *Input *Process *Product	*Formative *Summative	Obtain all information	*Before *while *after
2	Tyler (1942, 1950)	Context	Summative	Progress	*Before *while
3	Hammond (1973)	Process	Formative	Achievement	After
4	Scriven (1967, 1972)	output	Summative	Program’s strengths and weaknesses	After
5	CIRO (1970)	*Context *Input *Reaction *outcome	Summative	Implementation of Program	*early *implementation *outcome
6	Bell (1979)	*Reaction *Efficacy *Use *Value	Formative	Personality Improvement @ Change	*While *after
7	Kirkpatrick (1959)	*Reaction *Learning *Behavior *Outcome	*Formative *Summative	Result of Change	*Before *after
8	Responsive (1967)	*Report *Outcome	Summative	Information of the stakeholder	While
9	Illuminative (1972)	*Process *Outcome	*Formative *Summative	Strategic	*While *after

III. CONCLUSION

The use of the CIPP assessment model in assessing the effectiveness of the education development program is an approach to obtain information that adheres well with the program outcome for the decision makers because with the outcome, it can serve to address all issues like the significance of the program, the planning executed and so on. Even according to Stufflebeam⁹ the CIPP assessment model sees the collaboration between the assessors and the decision makers. Yet, the former’s role is even more important in proving the value of the program in its improvement. As a whole, the CIPP model is suitable to be used to evaluate the effectiveness of the education program as it helps to organizers to stay accountable when making decisions. A systematic effort is needed to assess the quality of the related module Rasmuna¹⁰, while the goal and objective of the study are very much appropriate to the CIPP model due to the feedback received from the assessors in the planning and implementation of the entrepreneurship development training program

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^[10] Rasmuna Hussan. (2010). *Penilaian Pelaksanaan Modul Asas Keusahawanan Kolej Komuniti KPTM*. Doctor of philosophy thesis. Fakulti Pendidikan. Universiti Kebangsaan Malaysia.

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The effect of curiosity on self-confidence and persistence

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Abstract

There are three important things to consider in supporting successful learning, namely curiosity, self-confidence, and persistence. The purpose of this research was to determine the effect of curiosity on self-confidence and persistence. This type of research is quantitative research. By using a random sampling technique, the sample of this research was 65 students in one semester of the mathematics education study program at the Islamic University of Malang. The data collected in this research is the result of a questionnaire about curiosity, self-confidence, and persistence. The questionnaire in this study consisted of a questionnaire about curiosity, self-confidence, and persistence. The questionnaire used in this study has met the validity and reliability. The results of the questionnaire were analyzed by correlation test and regression test with SPSS. The results showed that there was a correlation between curiosity with self-confidence and persistence. The results also show that curiosity has a positive effect on self-confidence by 19.6% and curiosity has a positive effect on persistence by 38.4%. This means that the effect of self-confidence is higher on persistence than self-confidence. Learning is expected to raise a high curiosity so that students' self-confidence and persistence can increase.

Key words

Curiosity, persistence, self-confidence, learning of mathematics.

I. INTRODUCTION

One of the most important things that must be considered in learning is curiosity. This is because, through curiosity, a student can gain new knowledge and skills [1], [2]. This is because curiosity affects the transformation of students into active individuals [3]. This curiosity is by human development which makes a person learn something, thus gaining new knowledge and skills [1], [2]. This curiosity is also by humans as social beings who make a person need information, thus obtaining new information [4]. This curiosity is a positive and beneficial characteristic for humans [5]. The results also show that there is a positive correlation between the level of curiosity and the use of learning strategies [6]. This curiosity allows a person to seek answers, explore problems, observe their environment, and understand events that are taking place in the world [7]. From these various opinions, it can be concluded that the importance of curiosity is that it can benefit students and can make students active in learning, thus gaining new knowledge and skills and obtaining important information for successful learning.

Experts in defining curiosity have differences. This difference in the definition of curiosity is based on the context of the research. For example, curiosity can be defined as an individual character who likes to seek and explore knowledge [3]. Curiosity is also defined as a willingness to understand or learn something [7]. Students who have curiosity tend to ask questions and look for answers, they need to investigate and look for something [8]. Furthermore, curiosity can be understood from two points of view. The first

curiosity is considered as a motivated desire to achieve information, the second is interpreted as a passion that shows one's motivation [7]. The theoretical model of curiosity is divided into two dimensions. The first dimension is the desire to seek new experiences and the second dimension is an appreciation of the complex, new and unknown nature of life [5]. The dimension of curiosity in this research is the desire to seek new experiences in the form of new alternatives in solving mathematical problems.

The importance of curiosity for students to have makes researchers interested in researching curiosity. Previous research tested the correlation between curiosity and motivation, which showed a positive relationship between curiosity and motivation [6]. Another research showed that there were significant differences in curiosity based on gender, majors, and monthly expenses [7]. Other research have shown that perceptions of teaching styles contribute to students' curiosity and motivation to be active in the classroom [9]. Other studies have shown a correlation between problem-solving abilities and the level of curiosity of prospective teachers [10]. Other studies have shown that learning climate, mindset, and curiosity have an important effect on academic achievement [11]. Other research shows that curiosity arises from personal which is conducive to the process of developing cultural knowledge [12]. Other researchers investigated the impact of nature education on curiosity, showing that nature education can positively increase students' scientific curiosity [13].

From these various research, there has been no research that has investigated the effect of curiosity on self-confidence and persistence. Therefore, this research focuses on investigating

the effect of curiosity on students' self-confidence and persistence. Confidence and self-persistence are important for students. The results showed that the self-confidence approach is a subscale for dealing with stress and anxiety of social display [14]. It is important for all students to feel confident in their ability to do mathematics in making decisions and their career choices based on their disposition towards mathematics [15]. This self-confidence is important for students to have to succeed in learning [16]. Academic persistence to complete a degree is a psychological factor that influences dropout rates [17]. The level of persistence of students and their development is important in their education period [18]. This persistence is very important for student success in college [19],[20]. Confidence in this research is defined as an attitude of self-confidence in solving mathematics problems, having the courage to express opinions, and being confident when asked to work in front of them. Persistence in this research is defined as the ability to continue working on difficult questions and trying to find the perfect answer [21]. Thus, the purpose of this research was to determine the effect of curiosity on self-confidence and persistence. The hypotheses of this research are: H_0 = there is no effect of curiosity on students' self-confidence and persistence and H_a = there is a significant effect of curiosity on students' self-confidence and persistence.

II. METHOD

This type of research is quantitative research. The sample of this research consisted of 65 students of the mathematics education study program in one semester at the Islamic University of Malang. The sample selection technique in this study was carried out using a random sampling technique. This is because there are no specific criteria in determining the research sample. The predictor variable in this research is curiosity (X), while the dependent variable in this research is self-confidence (Y1) and persistence (Y2). The measurement of these two variables uses a Likert scale. Where the Likert scale is used to measure a person's attitude or response. Indicators of predictor variables and dependent variables can be seen in Table 1.

Table 1. Indicators of Predictor and Dependent Variables.

Variables	Indicators
Predictor variables: Curiosity (X)	<ul style="list-style-type: none"> ▪ Interested in learning mathematics. ▪ Happy with the assignments given by the lecturer. ▪ Want to know more clearly about his work mistakes. ▪ Always study even if there is no assignment. ▪ Always follow the learning in class, even though busy. ▪ Work on the problems in the book, even if there is no assignment. ▪ Keep working on the problem, even though it is difficult.

Variables	Indicators
Dependent variable: Self-Confidence (Y1)	<ul style="list-style-type: none"> ▪ Confidence can do the problem ▪ Confidence when asked by the teacher to come forward ▪ Confidence can do every question ▪ Believe in yourself more than friends ▪ Confident in discussing with friends ▪ Confidence in answering teacher questions ▪ Confidence in expressing opinions
Dependent variable: Persistence (Y2)	<ul style="list-style-type: none"> ▪ Do not despair if you get a difficult math problem. ▪ Feeling worried if you are not able to solve the problem well. ▪ Keep trying to solve difficult questions until you find the right answer. ▪ Continue to study math even if there is no homework. ▪ Try to solve challenging problems.

The instrument of this research is a questionnaire to determine curiosity, self-confidence, and persistence. This questionnaire consists of 7 statements about curiosity, 9 statements about self-confidence, and 5 statements about persistence which were developed from the indicators in Table 1. Each statement uses the choices Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Each of these options was given a score of 4, 3, 2, and 1 for positive statements, while for negative statements a score of 1, 2, 3, and 4 for curiosity, self-confidence, and persistence. Quantitative data analysis in this research was carried out in two stages. The first stage is to change the score obtained by the respondent into the value of curiosity, self-confidence, and persistence by dividing the score obtained by the maximum score than multiplying by 100. Thus, the respondents' curiosity, self-confidence, and persistence are obtained. The second step is to analyze the correlation and regression between two variables, namely the curiosity with self-confidence, and the curiosity with persistence. Correlation analysis uses Pearson's product-moment correlation, while regression analysis uses linear regression with SPSS. The significance level of the correlation and regression test results in this study was 5%. Therefore, the test results criteria are accepted if the value of Sig. < 0.05. Thus there is a correlation and there is a significant effect of curiosity on self-confidence and persistence.

III. RESULT

A. The effect of curiosity on self-confidence.

The results of the correlation test between curiosity and self-confidence can be seen in Table 2. The results of the

linear regression test between the variables of curiosity and self-confidence can be seen in Table 3 and Table 4.

Table 2. Correlation Test Results

	Curiosity	Self-Confident
Curiosity Pearson Correlation	1	.443**
Sig. (2-tailed)		.000
N	65	65

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 2. it can be seen that the value of Sig. (2-tailed) is $0.000 < 0.05$, this means it can conclude that there is a significant correlation between curiosity and self-confidence.

Table 3. Summary Model of Linear Regression Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.443 ^a	.196	.184	7.717

a. Predictors: (Constant), Self-Confident

Table 4. Coefficients^a Regression Test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	45.567	7.541		6.042	.000
Self-Confident	.427	.109	.443	3.922	.000

a. Dependent Variable: Curiosity

From Table 3. it can be seen that the value of the influence of curiosity on self-confidence can be seen from the R Square value, which is 0.196. This value means that the effect of curiosity on self-confidence is 19.6% and another 80.4% is influenced by other factors not identified in this research. From Table 4. it can be seen that the value of Sig. of self-confidence of $0.000 < 0.05$. It can be concluded that H0 is rejected and Ha is accepted. There is a significant effect of curiosity on self-confidence. From Table 4. it can also be seen that the constant value of the Unstandardized Coefficients is 45.567. This means that if there is no curiosity value, then the self-confidence value is 45.567. The regression coefficient is 0.427, which means that for every 1% addition to the level of curiosity, self-confidence will increase by 0.427. It can also be said that curiosity has a positive effect on self-confidence. The regression equation for curiosity and self-confidence (1).

$$Y = 45.567 + 0.427X \quad (1)$$

The example, for someone who has a low curiosity value (e.g. 50), using equation (1) then the self-confidence value is 66.917. For someone who has a high curiosity value (e.g. 95), using equation (1), the self-confidence value is 86.132. It can be said that the higher a person's curiosity, the higher the self-confidence value.

B. The effect of curiosity on persistence.

The results of the correlation test between curiosity and persistence can be seen in Table 5. The results of the linear regression test between the variables of curiosity and persistence can be seen in Table 6 and Table 7.

Table 5. Correlation Test Results

	Persistence	Curiosity
Persistence Pearson Correlation	1	.620**
Sig. (2-tailed)		.000
N	65	65

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 5. it can be seen that the value of Sig. (2-tailed) is $0.000 < 0.05$. This means it can conclude that is a significant correlation between curiosity and persistence.

Table 6. Summary Model of Linear Regression Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620 ^a	.384	.374	6.757

a. Predictors: (Constant), Persistence

Table 7. Coefficients^a Regression Test Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	37.418	6.043		6.191	.000
Persistence	.499	.080	.620	6.264	.000

a. Dependent Variable: Curiosity

From Table 6. it can be seen that the value of the influence of curiosity on persistence can be seen from the R Square value, which is 0.384. This value means that the effect of curiosity on persistence is 38.4% and the other 61.6% is influenced by other factors not identified in this research. From Table 7. it can be seen that the value of Sig. of persistence is $0.000 < 0.05$. It can be concluded that H0 is rejected and Ha is accepted. That is a significant effect of curiosity on persistence. From Table 7. it can also be seen that the constant value of the Unstandardized Coefficients is 37.418. This means that if there is no curiosity value, then the persistence value is 37.418. The regression coefficient is 0.499, which means that for every 1% addition to the level of curiosity, persistence will increase by 0.499. It can also be said that curiosity has a positive effect on persistence. The regression equation from curiosity and persistence (2).

$$Y = 37.418 + 0.499X \quad (2)$$

For example, for someone who has a low curiosity value (e.g. 50), using equation (2) then the persistence value is 62.368. For someone who has a high curiosity value (e.g. 95), using equation (1) then the persistence value is 84.823. It can be said that the higher a person's curiosity, the higher the value of persistence.

IV. DISCUSSION

The results of this research contributed to developing the results of previous research on curiosity [3], [4], [10]–[12], [22] by showing that curiosity is correlated with self-confidence and persistence. Curiosity also has a positive effect on students' self-confidence and persistence. The effect of curiosity on student confidence is 19.6% and the effect of curiosity on student persistence is 38.4%. This means that curiosity has a greater influence on persistence than self-confidence. Several factors cause curiosity to have a greater effect on persistence than self-confidence.

The first factor is curiosity about new information which makes someone will try to be persistent in finding the right information. The results of the research indicate that curiosity can lead to an increase in one's information [1]. Meanwhile, persistence in seeking information will increase the experience in seeking information. This experience will affect a person's self-confidence in acting. As the results of previous studies showed that the experience in learning by conducting experimental activities can affect students' self-confidence, interest, and desire to learn [23]. Thus it can be said that curiosity about information will affect persistence in seeking information which then affects self-confidence in seeking information.

The second factor is curiosity about various alternative solutions to mathematical problems. This curiosity will make students persistent in finding alternative solutions to increase their knowledge about alternative solutions. By gaining additional knowledge in solving problems, his ability will increase. This increased ability will affect students' self-confidence in solving mathematical problems. This is by the results of previous studies showing that students who have high abilities have high self-confidence, students who have low abilities also have low confidence in solving problems [24]. The results of previous research also show that students who have high abilities have various representations in solving mathematical problems [25], [26]. Thus, curiosity about alternative solutions will affect the persistence in finding answers which in the end will also affect students' self-confidence.

The third factor is curiosity about the mistakes. This curiosity about mistakes makes a person persistent in finding the right way. The results of previous studies showed that a student's persistence in finding the right way made a student able to revise the wrong answer and get the right answer [27]–[29]. The results of research previous show that if students do not have curiosity about the wrong answers, they often make mistakes in solving mathematical problems [30], [31]. This is because it will repeat the wrong answer to solve other mathematics problems. Thus curiosity about the wrong answer affects the persistence to find the right answer which in turn will affect students' confidence in solving problems.

From the results of this research, teachers or lecturers need to increase students' curiosity in learning mathematics. In addition to increasing curiosity, a teacher or lecturer has a certain role in increasing student confidence and persistence. The first role is as a counselor. The results of the research indicate that mathematics teachers need to take on the role of counselors in overcoming students' mathematics anxiety in the classroom [15]. The second role is to develop a personal

learning model. The results show that the personal development model can significantly develop students' self-confidence [16]. The third role is to provide social support. The results of previous studies showed that there was a positive correlation between social support, self-confidence, optimistic approach, and school attachment [32]. The fourth role is to create a conducive learning environment. The results of previous studies have shown that a learning environment that is full of trust, security, and values can optimize learning outcomes [33]. The fifth role is to improve performance. The results showed that the performance and self-confidence of prospective teacher students affect readiness to teach [34]. The sixth role is to pay attention to gender, age, and school graduation in motivating. This is by the results of previous studies which showed that students' self-confidence scores varied according to gender, age, and the type of high school they graduated from [35]. Through the role of the teacher or lecturer, it is hoped that the curiosity, self-confidence, and persistence of students will increase so that student achievement can also increase.

V. CONCLUSION

The purpose of this study, namely to determine the effect of curiosity on self-confidence and persistence. From the results of the research, it can be concluded that curiosity is correlated with self-confidence and persistence. From the results of the research, it can also be concluded that curiosity has a positive effect on self-confidence by 19.6% and curiosity has a positive effect on persistence by 38.4%. This means that curiosity has a greater effect on persistence than self-confidence. Therefore, the recommendation for teachers or lecturers is to do learning that can increase students' curiosity, so that students' self-confidence and persistence can increase. Furthermore, the researcher recommends further research on the analysis of student confidence and persistence based on the level of student curiosity.

VI. ACKNOWLEDGMENT

Thanks to Allah SWT and my both parents who have provided prayers and motivation for the author to continue to be enthusiastic in learning. Thanks to the Rector of the Islamic University of Malang and the head of the Institute for Research and Community Service at the Islamic University of Malang who have funded this research activity.

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Modelling Dark Data Management Framework: a Grounded Theory

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Abstract

The phenomenon of Big Data has no longer become a new issue for business players as the evolution of the big data characteristics from the classical 3Vs (volume, velocity, and variety) expanded to become the 42Vs. Interconnected electronic devices and IoT tremendously contribute to the increasing incidents of Big Data, which are not only experienced personally but also by businesses. While the awareness of dark data is still lacking and the evidence of publication merely exhibits an approach to the dark data phenomenon, this creates a huge gap in the subject matter clearly. Therefore, the study was proposed to investigate dark data management by Malaysian SMEs for business operations. The core of the study does not compensate the SMEs for the better way of managing dark data, but rather focuses on investigating its current circumstances. The study employed a qualitative approach to investigate the major purpose of the research and propose to analyze the data using Grounded Theory Methodology (GTM). As a result, the identification of the valuable dark data residing in the enterprise repository can be defined appropriately, providing insight on the construction of the management of dark data framework.

Key words

Dark data, dark data management framework, grounded theory, Malaysia.

I. INTRODUCTION

Some of the impacts of dark data are that it makes distributed and duplicated content widespread without explicit oversight and weakens security. In addition, the sheer volume of dark data impacts the costs for searching and producing appropriate information and imposes a wasted storage cost in operating budgets. Meanwhile, nonevidence-based decisions have always been made by the administration of an organization, which in the end would jeopardize the whole organization's operation because of ignoring the policies and circulars, which are referred to as "dark data" in this case [5], [10].

The search for dark data publications was extended to look for any research regarding dark data management in a Malaysian context. Surprisingly, only one paper appears to be published from Malaysia. Accordingly, it was assumed that Malaysian awareness pertaining to dark data management is very minimal, yet they are experiencing the circumstances of having dark data in their storage, even though many researchers emphasize that dark data significantly influences better business intelligence, increased competitive advantages, and minimizes enterprise risks [4], [10], [12], [13], [16]. Therefore, this study was proposed to investigate on how dark data being managed by the SMEs for business operation to construct the dark data management framework.

II. LITERATURE REVIEW

Analyzing published literature assisted scholars in developing an understanding of the epistemology of dark

data. Scholars, Scopus, and Web of Science were used to locate existing literature in the topic under study. The literature searches encountered a significant obstacle, since publications published during the recent five years indicated a scarcity of articles. As a result, the search ranges for the literature were widened to include any publication date that had the word "dark data" in the article.

The search results seem to be more compelling, since a total of 7,020 hits were discovered. Unfortunately, only 56 journal papers and 17 non-academic pieces were included in the study after removing comparable material that was indexed in all databases, omitting non-English literature, and excluding full-text articles. A analysis of those publications showed three significant findings about the present status of dark data: (1) the vague definition of dark data; (2) the causes of dark data; and (3) a restricted strategy to dark data management.

Due to a dearth of study on the dark data issue, the volatility of dark data definitions focuses on searchability, which encompasses metadata and classification [8], [21]; and usability [11]. The researchers observed that the factors affecting the incidence of dark data are restricted to the process of guaranteeing data quality, which includes data accessibility, correctness, and traceability [14].

While dark data is defined as vital data that exists outside of what is typically recorded and analysed [14], the strategy to managing dark data has been proven to be quite restricted. Only a few academics and industry participants have argued that dark data may be adequately managed by developing a

data lake infrastructure utilising schematic approach [26]; data management consists of four phases: identification, categorization, controls, and continual monitoring [4].

Dark data has been defined from a variety of views, as Corallo and colleague [6] analysed 22 papers relevant to the definition of dark data from a variety of areas and perspectives. They undertook a thorough study of the literature in order to support the formulation of a dark data definition specific to the manufacturing sector. The definition of dark data appears to fall under the properties of searchability [15], accessibility [7], unknown existence [17], uncategorized and ignored data [14], which are influenced by their formats and result in unused data being hoarded over time [26].

While few publications address the features and characteristics of dark data, the definition gap based on sound theory remains unresolved and unexplained by real-world experiences. There were several scholarly articles and research organizations that tackled dark data. However, from a non-academic perspective, only large organizations have published white papers and research articles on the existence of dark data, its management, and the potential uses [6].

Dark data occurrences in the field of big data sparked an eager investigation into the data's effect and current state on businesses. Numerous research businesses from across the globe did dark data research in attempt to decipher the mystery surrounding dark data and the advantages it presented to the global big data community. As a consequence, doing dark data research through the lens of Malaysia's small and medium-sized firms will fill the hole.

In a nutshell, the literature study reveals that hidden values lurk in large unstructured data, which presents the opportunity for hidden, abandoned, and underused prospective data, colloquially referred to as "dark data," to devour storage space in organizational repositories. According to scholars, its presence would be damaging to the development and survival of businesses.

On the other hand, a convincing definition of dark data has not been established, and a number of dark data definitions have been discovered, each expressing a unique interpretation of the dark data analogy. Due to the inability to detect the presence of dark data, the provisional definition generates considerable misunderstanding among data owners over how to plan for dealing with such data. Furthermore, given the scarcity of publications demonstrating the advantages of dark data in reality, the risk of dark data's presence seems to lie in emasculating the untapped potential of dark data rather than disclosing the leverage it provides.

Although just a few research firms discovered the existence of dark data and more than half of it was recognized as such from data holdings, the identification of dark data was still based on the principles of underused stored data assets. Indeed, dark data notion encompasses more than data hoarding. As a result, although reaping the benefits of dark

data remains a trade secret of large corporations, this phenomenon has produced a massive gap in dark data use, particularly for small businesses and public sectors. As a result, more inquiry is necessary to close the research gap and expose the shadowy data management methods.

III. Methodology

A qualitative research technique was used to begin the investigation since there is minimal evidence supporting the hypothesis of dark data, which led to the study adopting a constructivist or interpretivist philosophical stance. SMEs were chosen as a sample in this study because publication of dark data research in journals or white papers is typically dominated by large firms or research entities such as Fortune 500 companies in the United States or proprietary research firms such as Veritas and Ipsos, but none were discovered involving SMEs, particularly in Malaysia.

A. Malaysian SMEs

According to the Bank Negara Malaysia (BNM), enterprises in Malaysia are defined based on economic activities that are divided into categories and sectors based on sales turnover or employment figures. Generally speaking, Malaysian businesses may be divided into two types of general categories; (1) Manufacturing and (2) Services & Others. Manufacturing enterprises are those that turn raw materials into finished goods via the use of chemicals or physical processes. Manufacturing is defined as a firm having a sales turnover of less than RM50 million or full-time employees of less than 200 people (whichever is lower). Meanwhile, business sectors distinguish between services and others, with services including everything from retail to wholesale to hotels and restaurants to financial intermediation. Other services include everything from manufacturing to distribution to entertainment to financial intermediation to research and development (R&D) to logistics, warehouses, engineering, and other manufacturing-related services like research and development (R&D). In addition, primary agriculture, construction, and mining and quarrying are all examples of economic activity classified as others.

Malaysian SMEs have seen a growth in their number of establishments over the previous decade, with a total of 645,136 new businesses being established in 2011 and 1,151,119 in 2020. As a group, they generated 38.3 percent of the nation's Gross Domestic Product (GDP), which is considered the second-largest contribution and is seen as very essential in the country's nation-building programme. The national budget of Malaysia has budgeted RM1.9 billion to encourage the growth of SMEs in the country by 2021.

Those enterprises that fall outside of the National SME Development Council's (NSDC) definition of a small and medium-sized enterprise (SME) are classified as large firms and do not fall under the SMEs cluster [22].

Businesses that have registered with the Company Commission of Malaysia (CCM) and are thus eligible to be classified as SMEs in Malaysia were used as samples for the

research. Companies registered with CCM can be verified by searching for their company name on the SSM e-Info portal. Unregistered businesses, on the other hand, were excluded from the study because they were not officially recognized as valid and had already violated the Registration of Business Act 1956 (as amended). Thus, 18 Malaysian SMEs were selected as cases for the research using theoretical sampling and regarded as expert samples based on their expertise and practices in data processing. This expert sampling technique was used to elicit expert responses throughout the data gathering process. For this study, expert samples were drawn from company owners who have specialized knowledge in the subject area. They are recognized as experts in the field due to their expertise and practices in enterprise data handling; they are prominent in the company's data handling processes; and they are active in analyzing their data to improve the company's performance. Because the goal is to densify existing emerging categories through range and variation in dimension and fill in the gaps in emerging theory by looking into new emerging categories, data from the analysis provide information on what to sample next. In theoretical sampling, data from the analysis provide information on what to sample next [3], [27]. In grounded theory, Strauss and Corbin [2] identified theoretical sampling stages that occurred in tandem with the phases of coding analysis that took place which happened during Open Coding, Axial Coding and Selective Coding.

Despite the fact that registration of a company is one of the requirements, the definition of SMEs in Malaysia allows for the exclusion of enterprises that are not relevant to the research. Large businesses such as factories, insurance providers, and any other organization that does not meet the criteria of a small and medium-sized enterprise (SME) were eliminated from the study and deemed to be unsuitable since they were not included in the population that was chosen. Some Malaysian businesses outsourced or hired personnel to deal with the company's data management responsibilities; however, these entities were excluded from participating in the survey because they are referring to the needs and requirements determined by business owners, and because certain procedures or actions taken are sometimes unable to be explained in detail, they were excluded from participating in the survey. The sampling approach used to assure reputable and dependable sources of information for a research project has a significant impact on the selection of data providers. The non-probability sampling approach was used in this study to collect data and resources in order to achieve the goals of the study. The non-probability sampling procedure was carried out in three steps in order to minimize data collection conflicts between the various stages.

The data collection method was semi-structured interviews supervised by an interview guide to keep the interview on course, which included several open-ended questions to elicit information on dark data from the respondents' experience and viewpoint [19]. The data were transcribed and analyzed using the Grounded Theory Methodology (GTM). The GTM coding processes were used to the transcribed interviews in three stages: open coding, axial coding, and selective coding.

The process of study design is shown in detail in Fig. 1. The numbers in the graphic correspond to the stages of the research process.

Content analysis is the foundation qualitative analysis used in this study as the researcher analyzed the manuscript document of the interview transcription before engaging with data analysis process. These manuscripts of data were recorded from the story told by the theoretical samples which purposively selected cases to initiate the research and to achieve the study objectives. During the analysis, codes and concepts were assigned to phenomenon called as the coding process and then those codes and concepts compared to each other using theoretical comparison known as constant comparative analysis which involving both cross-case pattern analysis and cross-case pattern analysis. Besides, during the GTM analysis, the researcher was required to analyze the data inductively to free himself from any preconceived ideas and concepts to ensure the categories established is grounded by the data. At this point deductive analysis was avoided to protect the data analysis results from any existing theories or knowledge. During the coding process the researcher experienced both indigenous concept analysis known as the in-vivo codes and analyst generated concept which used to provide categories to represent phenomenon experienced by the respondents as transcribed in the manuscript. Another challenge that the researcher has to face during the analysis is to distinguish the concepts and categories into distinct topic by interpreting meaning and its implication. The concepts and categories were also distinguished using Indigenous Typologies and Analyst Constructed Typologies to accommodate the requirement of the GTM approach and finally answering the research questions.

Memo writing, diagramming, and field notes were analyzed in this study and were deemed to be crucial components that aid in the elicitation of theory using the grounded theory technique. Finally, story lining was utilized to connect all categories and ideas by presenting the problem of dark data management among Malaysian SMEs.

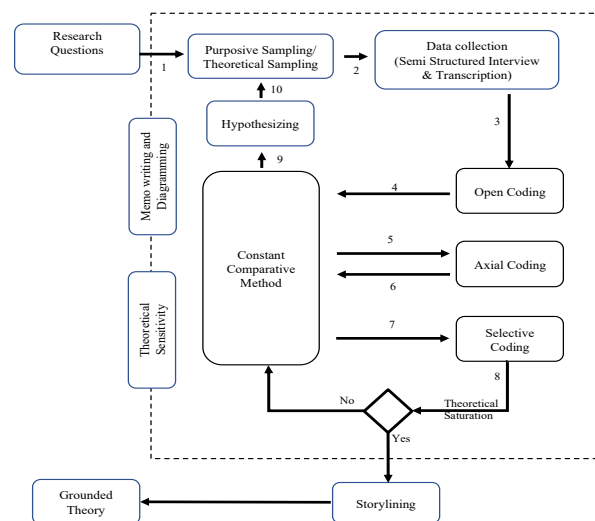


Fig. 1: Grounded Theory Methodology

IV. FINDINGS

Findings of the study indicated that all business owners were employing Dark Data Lifecycle Management (DDLDM), which entails appointing a data expert or caretaker and doing data caretaking or data stewarding duties. Not only did business owners utilize DDLDM to manage the data in the repository, but also to avoid the emergence of dark data. As seen in Fig. 2, DDLDM employs a six-stage lifecycle approach to dark data management.

B. Specializing Caretaking

A specialized caretaker is assigned to carry out Dark Data Lifecycle Management, which is the first step in DDLDM's inception and progression (DDLDM). This was overcome by study conducted by Schembera & Duran [20] and Splunk [24], which concluded that the work of dark data management must be carried out by particular persons who are knowledgeable and capable of performing dark data management functions. According to the findings of the survey, the majority of business owners held the bulk of data management duties since they are the individuals who are most acquainted with the overall functioning and decision-making of the company.

C. Collecting

The second stage of collection is the next step in the DDLDM cycle. During business operations, it refers to the activity of procuring data, in which business owners are involved in the process of capturing dark data across multiple platforms, generating data from transactions, gathering data for specific business purposes, and storing the data in a data storage facility. Because of the effects of black data, which refers to data that has been obtained but has gone missing or been destroyed, the respondents' data collection operations were efficiently structured via data procurement and data preserving measures. The research conducted by Kevin et al. [16] and Zhang et al. [28] also revealed that the method of gathering dark data should be used as the first step in order to detect dark data that is already there.

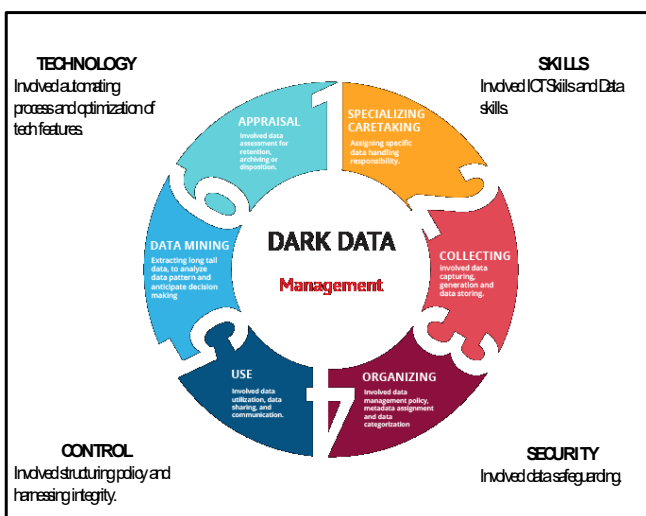


Fig. 2: Dark Data Management Framework

D. Organizing

As a result of respondents' difficulties in accessing and retrieving dark data after the collection stage, we created a

data organization system to address this issue. Because of this disarray, it has been shown that the vast majority of micro-sized organizations have met undisclosed data (black data) that has caused damage to their company's operations and performance. A consequence of this was that the participants added metadata to the stored data (such as categories, headers, and descriptions) in order to make the dark data retrievable and to reduce instances of the dark data phenomenon. A few activities such as cataloging and categorizing were identified as techniques to organizing dark data in order to improve data accessibility and retrievability, according to the findings of the study. It was the primary goal of organizing dark data, as described by Almeida et al. [2], to make it findable, accessible, interoperable, and reusable, otherwise known as FAIR. This goal could not be achieved by uncataloged data [6] and unclassified data [2],[21].

E. Use

Furthermore, the collection and structuring of data facilitates the consumption or use of the data collected. People may apply for jobs and engage with one another both within and outside the firm if they have access to and can get their data from the system. Using dark data to aid in decision-making and performance measurement, according to the results, included utilizing the information to make decisions and measure performance. Dark data was also utilized to retrieve data that had been corrupted or rendered inaccessible, and it was shared among authorized users in order to improve data transparency. These signals were also emphasized by Gimple [8], who identified four approaches to use dark data to produce corporate value, including enhancing return on assets, reengaging consumers, updating product offerings, and exploring new business models. Furthermore, Hands [10] said that dark data (data passwords) were also employed to safeguard the data from being accessed by unauthorized individuals, according to the author.

F. Data Mining

Using dark data requires data analysis and required company owners to acquire additional data. The results show that data mining activities need additional data extraction. Data mining allowed business executives to get a thorough picture of their operations by examining data trends. Concurrently, the participants analyzed dark data to foresee the future and develop the firm. In this attempt, the firm owner seeks for data not covered by the standard data lifecycle management (DLM). It is a new addition to the DLM. Scholars and research articles on dark data management seldom discussed data mining. Few technologies have been built to support Deepdive, Winover, and Datumize [1], [14], [28]. However, the quality of data value evaluation and contextual extraction made dark data extraction characteristics restricted. The research concluded that data mining should be part of the dark data management process rather than a separate approach.

G. Appraisal

Finally, a decision is made on whether the dark data will be kept or disposed of. It's common for business owners and

caretakers to use data mining as a first step in identifying and valuing any darker data they discover over the course of their work. Auditing and weeding procedures were used to verify the validity and accuracy of the dark data, and the value of the dark data was evaluated as a consequence. Data that was no longer needed or relevant was then permanently deleted, freeing up room for fresh data to accumulate.

The results also show that the DDLM is an attempt to provide a comprehensive analytical recommendation for dark data management solutions. These six stages were supported by the enabling attributes consists of:

1) Technology

It's all about the technology used to process the dark data. The data shows that technology was employed to automate data processing and technological characteristics were adjusted to meet the business demands for dark data processing. As stated by Gimpel and Alter [9], companies should invest in dark data technology and link up with that technology to begin reaping the rewards of dark data analysis.

2) Skills

Data suggests that anybody dealing with dark data should have a working knowledge of ICT equipment, as well as data literacy and data management abilities. Dark data processing may be sped up with the use of ICT equipment rather to being done by hand, which takes a long time. Data scientists and computer engineers are needed to deal with the dark data, according to Schembera and Duran [20], who developed the Scientific data officer position.

3) Security

There is evidence to suggest that data security is concerned with preventing the loss of data as a result of its accessibility, usage, or interoperability. Researchers found that restricting access to data, constantly monitoring data protection to uncover security gaps and treating data catastrophe planning as a critical contingency plan all contributed to the safety of dark data. For the restoration of critical business activities and the continuance of operations until the system can be restored to its pre-disaster condition, these techniques provide adequate data protection [18], [23].

4) Control

According to results, control is a technique through which all data caretaking procedures are linked and adhere to a standard and structured procedure. The policy and the integrity culture are the two most important aspects of control. As a result, the control mechanism's success rate would be skewed by the absence of one or both of the components. With the policy compliance and integrity culture, dark data may be repressed since it manages all data caretaking operations, and this control characteristic has already been won by Commvault (2014) and Kevin et al. (2016).

V. DISCUSSION AND CONCLUSION

Dark data refers to valuable assets that are held inside or outside of an institution's repository and storage facility and are difficult or impossible to locate, are unavailable, and are not used due to their unavailability. However, their potential worth would have an impact on the accuracy of data analysis, which would be used to assist strategic planning and decision making in a commercial firm's decision-making process.

Dark Data Lifecycle Management was identified as a strategy that would contribute to the suppression of dark data while also allowing for the mitigation of the risk and effect of dark data. This effective implementation of DDLM is made possible by the enabling attributes, which are comprised of technology, skills, security, and management control. As a result, even if dark data could not be completely eradicated, lowering the frequency of dark data lowered data storage consumption, cost of keeping, and handling, while simultaneously increasing company profitability and improving operation performance.

From the perspective of the study's practical application, the results may pique the attention of corporate executives who want to interact with dark data by using the idea of dark data management and utilizing them for their own profit. By utilizing the DDLM method, business executives will be able to predict future strategic planning and learn about their abandoned valuable assets, referred to as dark data. Aside from that, the establishment of a Dark Data Management Framework will assist those company executives who are new to the process of managing their dark data assets in gaining a comprehensive understanding of dark data. It is anticipated that the application of theories derived from the study will assist business leaders in obtaining more accurate performance measurement, reducing a significant amount of time spent searching for data, and avoiding lost data trails or business data history as a result of the dark data phenomenon. Furthermore, the implementation of dark data management theory helps business executives to predict future strategic planning for their organizations while also stimulating commercial development.

The models that have been built may also be of interest to software developers who are working on the creation of computer applications for the suppression of the dark data phenomena in businesses. It is possible to utilize the framework of dark data management as a basis for the application by automating dark data mining and value assessment methods, which reduces the time required compared to when these activities are carried out in the traditional manner. Another advantage of this technology is the ability to analyze large amounts of data while still generating precise patterns and analyses.

The findings of the research may be of interest to the information professional community since they offer them with fresh insights into dark data and may serve as a conceptual foundation for future exploration. Additionally, the black data issue has been observed to be encountered by a variety of healthcare providers, engineering industries, and

government institutions, among other entities. The study's created theories are based on the behaviors of small and medium-sized enterprises (SMEs) and dark data, but it would be fascinating to see whether they might be applied in other sectors.

In conclusion, the dark data hoarded inside the repository will no longer pose a danger to the data owners but will instead serve as a valuable asset that can be used to leverage and reinforce competitive advantage, as well as to maintain a profitable company.

Although the study completed with the construction of Dark Data Management framework, however it has been built over the limitation of the study. Therefore, as the use of theoretical sampling, the samples were narrowed down to Malaysian SMEs, and only a small number of samples were explored in order to answer the study's research objectives. In future research, in order to evaluate the robustness of the theory established as a consequence of the research findings, conducting a wider statistical survey approach in order to create generalizability of the theory such as quantitative technique may be deemed appropriate for testing the idea in order to determine its generalizability. Furthermore, future research could extend the validation of the results by embarking in other disciplines with different group of respondents.

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Development of Three-Phase Protection Device

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Abstract

Providing protection in electrical networks promises bountiful benefits in preventing losses within the system. This study was conducted to design, construct and test the potential of a three-phase protection device in protecting three-phase motor against phase failure in the Institute of Agricultural and Biosystems Engineering Building particularly for the Ube Tech Dryer with the use of research methodologies both developmental and experimental. The three-phase protection device was designed and constructed practically and appropriately. It was safely and securely tested in respect of its level of technical performance in terms of its circuit functionality, phase failure response, and actual testing of the device. Series of tests were performed which guaranteed that the device had provided the expected performance without any faults or incorrect operations. The circuitry responded well after the simulation of the designed electrical connection using Electric Control Techniques Simulator software.

Key words

circuit functionality, phase failure, single phasing, three-phase protection device

I. INTRODUCTION

In a typical power system network which consists of generation, transmission and distribution phase is well managed by industries, companies, and utilities through their advanced equipment installed within their respective domains. Such equipment provides real time monitoring on system behavior and could even generate reports during system abnormality thus identifying the problem and potentially mitigating such occurrence. It is unfortunate that on the consumer side, such scenarios are not well recognized. The potential electrical hazards in the consumer side must be taken into consideration as much as giving importance to generation, transmission, and distribution phase of power system.

The recent increase in the use of power in residential, commercial, and even within the industry possess additional risks and serious problems to the grid, utility, electrical loads, and even for consumers themselves. Economically wise, three-phase power system are widely implemented within the electrical network for bulk power specially in transmission and distribution systems for delivering power to long distances. Generally, the three-phase system is said to be economical compared to a single phase in the sense that it transmits the same power requirement on a smaller size of conductors [3].

There are various applications of three-phase induction motors due to its noncomplex, robust structure and low-cost production [2]. Reference [11] pointed out various reasons that causes the reduction in useful life of three-phase motors up to 50%, these includes: (1) single phasing; (2) overvoltage; (3) phase reversal; and (4) overheating.

Further, most of the mechanical and electrical machines and equipment being utilized on a regular basis are dominantly operated by three-phase motors. It is therefore imperative to

provide adequate protection to three-phase motors due to their importance in terms of their multiple applications due to their features being resilient, efficient, and economical [1]. Modeling and simulation related studies have been conducted to assess a proposed protection device against machine overheating with the inclusion of an alarm system using a microcontroller [9]. Likewise, Reference [2] conducted a simulation on the possibility of developing a three-phase protection device for motors based on a Programmable Interface Controllers (PIC) microcontroller that attempts to identify and distinguish the fault that may occur. In a case study conducted, an alternative protection scheme for three-phase motors against phase failures was proposed and simulations were also conducted [7]. The concept also features protection from voltage variation and unbalance.

Reference [8] also presented a reliable and low-cost protection design for three-phase motors that monitors the speed, currents, and temperature changes. The device features the use of a microcontroller with multiple auxiliaries such as global system for mobile communications (GSM) and liquid crystal displays (LCDs). Similarly, Reference [10] made use of a GSM to control a three-phase motor using a microcontroller, the project also offers detecting overcurrent and overvoltage that informs users through GSM. Similar patents have been filed for motor protection system, patent CN109038498A disclosed a device to control a motor drive circuit by utilizing hardware circuit that offers faster response time in providing overcurrent protection [4]. A phase failure system and methodology intended to protect motor from single phasing was also filed with China Patent No.: CN106353609B that offers to detect and identify single phasing in three-phase source [6].

Nonetheless, these works and developments provided an insight and motivation in developing an alternative means of three-phase motor protection that is efficient, effective, economical, and reliable. The concept of the three-phase

protection device mainly addresses single phasing issues that threatens to damage the electric motors. Additionally, the device can identify the specific source phase that failed through indicators. Overloading and overcurrent protection was also included as a feature of the device together with overcurrent and protection against faults. Thus, this study focuses on the development of a phase failure protection device for three-phase motors to provide adequate protection against single phasing that threatens to damage and reduce the useful life of three-phase motors.

The main objective of the study was to develop a three-phase protection device to provide protection for three-phase motors against phase failure.

Specifically, it aimed to achieve the following objectives: 1. To design a three-phase protection device that will safeguard three-phase loads by disabling the power source during single failure;

2. To develop the three-phase protection device specifically designed to protect three-phase motors/loads against phase failure; and

3. To test the technical performance of the three-phase protection device in terms of: a. Circuit functionality; b. Phase failure response; and c. Actual testing of the device.

II. METHODOLOGY

A. Research Design

This study adopted developmental research design specifically for attaining the first and second objectives. Similarly, developmental research design is the main building block for obtaining the second objective of the study, it is the foundation for the construction and assembly of the three-phase protection device based from the prescribed design. In addition, this study used the experimental research design which is beneficial in the transitional execution between the second and third objectives. Also emphasized by Reference [5], an experiment is a controlled test conditions in order to conduct observations and investigate the functionality and plausibility of an expected feature, in this case, experiment was done to test the technical performance of the developed three-phase protection device.

B. Materials and Procedures

Suitable components are identified in order to obtain the desired functionalities of the three-phase protective device developed. Accordingly, appropriate course of action is determined for a refined component amalgamation as the protective device is constructed. The fundamental components and other essential elements for the development of the three-phase protective device includes: (1) Protective Device; (2) Overload Relay; (3) Magnetic Contactor; (4) Relays; (5) Push Buttons; (6) Pilot Indicators; (7) Electrical Wires; and (8) Enclosure.

An overview of the process flowchart presenting the procedures that were conducted from the start to finish in undertaking this study is presented in Fig. 1. It depicts the succession of tasks that needs to be accomplished orderly and systematically that will eventually lead to the attainment of a fully functional three-phase protection device specifically a design to provide protection against phase failure for three-phase motor.

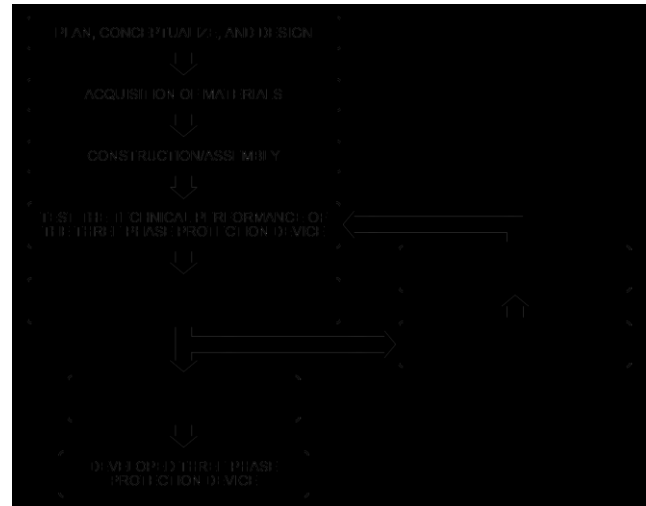


Figure 1. Process Flowchart for the Development of Three-Phase Protection Device

C. Simulation of the Developed Three-Phase Protection Device

In assessing how the circuitry had responded, simulation of the designed electrical connection using Electric Control Techniques Simulator software was done. In simulating the electric circuit, software libraries were selected and used based on the design and functions of the different components. After simulating the circuitry, testing was done by first clicking the Run button of the software. Secondly, by clicking the START button of the simulated device to see if it will work its expected output. Lastly, to check if the simulated model will respond if there is a phase failure, click one of the stop buttons and the system connected for that line will stop the operation.

D. Data Gathering

The specific data needed for the study are: (a) description, ratings and specification of the three-phase motor and (b) existing electrical loadings/wiring of the Ube Tech Dryer power supply. The description, ratings, and specification were indicated in the Ube Tech Dryer power supply and this data is utilized in order to make proper coordination of ratings, and specification with the three-phase protection device and the three-phase motor.

E. Data Analysis

The testing of the technical performance of the developed three-phase protection device was performed together with the three-phase motor where each device components' function and status were observed during various testing condition in terms of:

Circuit Functionality. A procedure was conducted where the required circuit functionality of the device is tested through simulation to assess the expected response of the circuitry in various scenarios. The conceptualized electrical circuitry was modeled and simulated in a computer software (Electrical Control Techniques Simulator) to assess how the circuitry will respond through several cases and conditions and test and ensure the presence of voltage across each phase using a Multimeter, thus, circuit functionality was verified by comparing the simulated results to that of the actual response of the device that was developed.

Phase Failure Response. Phase failure response was evaluated by connecting the three-phase protection device between a three-phase source and a three-phase motor/load. The motor and circuitry run normally when attempting to imitate phase failure by physically disconnecting one phase from the three-phase source while observing how the protective device and motor responds, and the protective device disconnects the motor load from the main supply and the motor stops.

Actual Testing. After testing the technical performance of the three-phase protection device and to prove if the device is functional in terms of its circuit functionality and phase failure response, the device was installed in the Institute of Agricultural and Biosystems Engineering (IABE) where a three-phase source is available for the Ube Tech Dryer that runs using three-phase source. Thus, actual testing of the device was conducted after installation.

III. results and discussion

F. Design

The main function of the three-phase protection device is to protect an equipment against single phasing, its equivalent circuitry shown in Fig. 2 satisfies the required purpose.

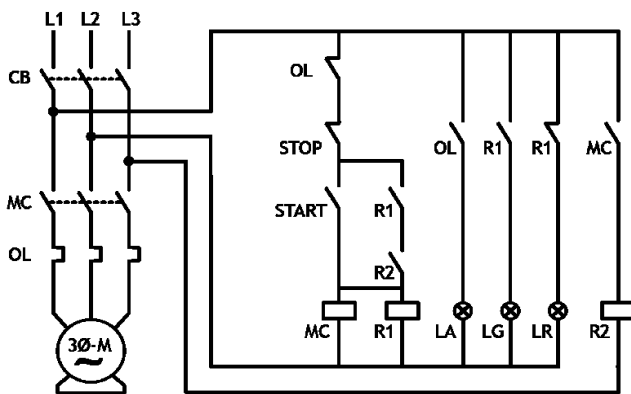


Figure 2. Electrical Wiring Diagram of the Developed Three-Phase Protection Device

G. Single Phasing Scenarios

In the event when L1 fails, both MC, R1, and R2 deenergizes since all these components are connected in L1 to operate, with MC deenergized, the equipment is disconnected from the source when source L1 fails. Accordingly, when L2 fails, both MC and R1 are deenergized, the equipment is disconnected from the source due to deenergized MC caused by L2. Likewise, when L3 fails, only R2 is deenergized, but with R2 deenergized, its normally open contact R2 serving as the latching contact for MC and R1 then opens which deenergizes the MC thus again disconnecting the equipment from the three-phase source. These scenarios ensures that the equipment will be protected by disconnecting it from the three-phase source when single-phasing occurs from any of the three-phase lines L1, L2, and L3.

H. Simulation

Simulation of the three-phase protection device was made to compare the result during various scenarios in actual testing. The real-time functionality of the three-phase protection device was tested by connecting it to the three-phase source and performing various controls and scenarios to observe its

performance during operation. After connecting the device into a three-phase source and clicking the play button, the equivalent delivery of power is shown in Fig. 3. It can be observed that only the red lamp (R) is turned on while the rest of the device components are turned off since there is no continuity of power delivery through their respective terminals. This indicates that the device is powered on, the three-phase source is available but not yet delivered to the three-phase motor.

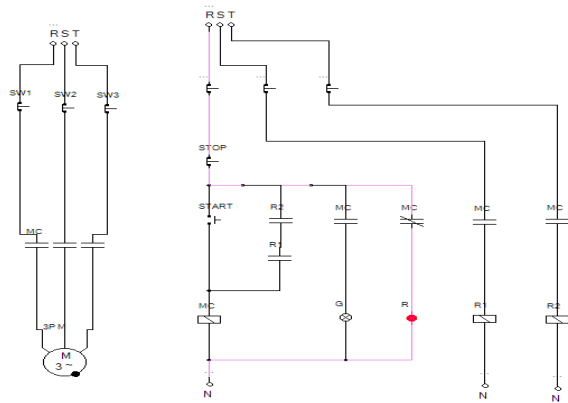


Figure 3. Circuit Diagram before Simulation

In order to run the three-phase motor, the device must be started by clicking the START push button. By doing so, there will be a continuity of power across MC thus it will be energized. Therefore, with the MC running, its three main contacts close and establishes power delivery form the three-phase source to the three-phase motor. The equivalent circuitry is shown in Fig. 4.

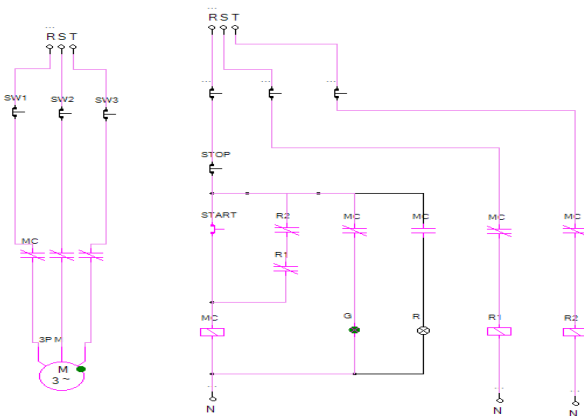


Figure 4. Circuit Diagram before Simulation

The simulation of the circuit conducted for the testing of the device shows that no matter what causes the single-phasing of a three-phase source, either loss of power in L1, L2, or L3, the three-phase protection device will always respond by shutting down the system in order to protect the three-phase motor or any three-phase equipment connected to it.

I. Development of the Three-Phase Protection Device

With the placement of the fundamental components of the three-phase protection device, the interconnections of electrical wirings were linked using a 1.5 mm² automotive wire by following the electrical wiring diagram shown in Fig.

2. The three-phase protection device requires a 230 VAC three-phase source circuit breaker for isolating and protecting the device itself from any electrical irregularities that may occur. The circuit breaker has a minimum ampere-trip rating of 30A as per Philippine Electrical Code.

J. Technical Performance

The technical performance of the three-phase protection device was tested in terms of: (1) circuit functionality; (2) phase failure response and (3) actual testing which ensured that the device functions as conceptualized and theorized. Series of tests were performed which guaranteed that the device will always provide expected performance without any faults or incorrect operations.

Circuit Functionality

The real-time functionality of the three-phase protection device was tested by connecting it to the three-phase source and performing various controls and scenarios to observe its actual performance during operation. After connecting the device into a three-phase source and switching the three-phase circuit breaker on, the equivalent delivery of power is shown in Fig.5. It can be observed that only the red pilot light (LR) is turned on while the rest of the device components are turned off since there is no continuity of power delivery through their respective terminals. This indicates that the device is powered on, the three-phase source is available but not yet delivered to the three-phase motor.

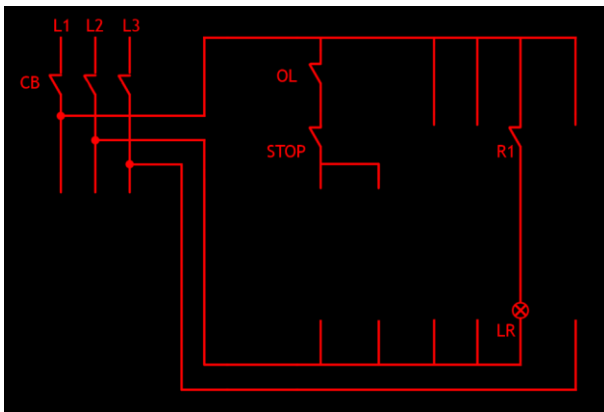


Figure 5. Power Delivery when the Device was connected in a Three-phase source

It can also be observed that the main contactor (MC) which is in-charge of delivering three-phase power to the motor is deenergized due to the open contacts of start push button (START), relay 1 (R1) and relay 2 (R2). Likewise, pilot lights amber (LA) and green (LG) are also deenergized because of open contacts of the overload relay (OL) and R1. R1 is also deenergized since it is connected across MC and R2 is turned off since the series contact of MC connected to it is open.

In order to run the three-phase motor, the device must be started by pressing the START push button. By doing so, there will be a continuity of power across MC thus it will be energized. Therefore, with the MC running, its three main contacts close and establishes power delivery from the three-phase source to the three-phase motor. The equivalent circuitry is shown in Fig. 6.

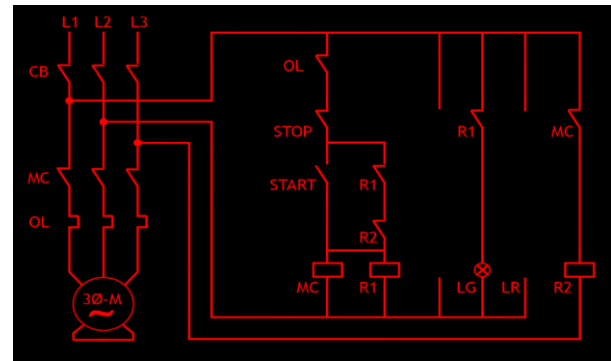


Figure 6. Power Delivery when the Device was Started

With MC energized, R1 and R2 will also be energized since it is connected across MC and the MC contact connected in R2 closes, respectively. This action closes both R1 and R2 that serves as the latching contact for MC, thus, even when the START push button is released, there is a continuous delivery of power in MC. The LR then turns off, LA is still off, and LG is turned on indicating that the system is in operation.

Pressing the STOP push button disconnects the MC and the circuit returns to its equivalent representation in Fig. 5. Similarly, when the overload relay detects overcurrent due to motor overloading caused by single-phasing, the OL trips and disconnects the MC thus stopping the device. The scenario was replicated by activating the trip mechanism of the OL which simulates an overcurrent in the relay. Its equivalent circuitry is then presented in Fig. 7.

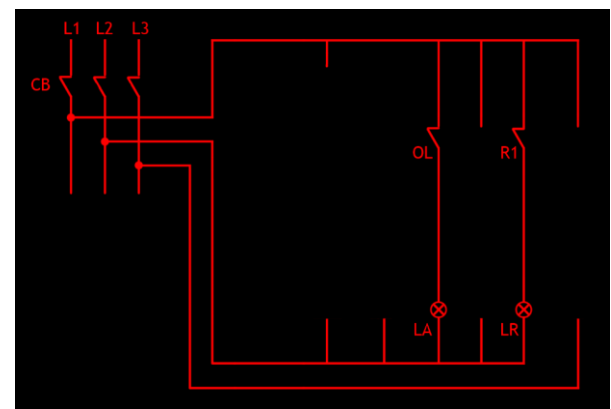


Figure 7. Power Delivery when the Device detected Overcurrent

The disconnected MC also disconnects relays, R1 and R2. The pilot lights statuses are: off for LG, on for LR, and on for LA. The pilot light indicates that the device or system is currently stopped due to overcurrent detection. This scenario disables the system such that it will not start even if the START push button is pressed. The OL has a reset button that must be pressed to reset the OL to its normal operating condition and by doing so, the equivalent circuitry returns to Fig. 5.

The detailed testing procedures for each device was recorded together with the expected results of each action. All conducted testing procedures performed satisfied its respective expected results with no errors or misoperation.

Phase Failure Response

The device's response against single phasing was conducted by manually disconnecting any one of the phases of the three-phase power supply. Another three-phase circuit breaker with independent switch for each phase was installed prior to the device's internal three phase protective device. Each of the lines (L1, L2, and L3) was manually turned off to imitate a single phasing event caused from any of the phases. When a single-phasing occurs, the three-phase protection device is expected to respond by shutting the system down immediately to disconnect the three-phase motor/load from the three-phase supply.

For single-phasing caused by loss of power from L1, the equivalent power delivery is shown in Fig. 8. Since all device components has a terminal that is connected to L1, every device shuts down immediately when power is lost in L1, thus, disconnecting the three-phase motor from the three-phase source.

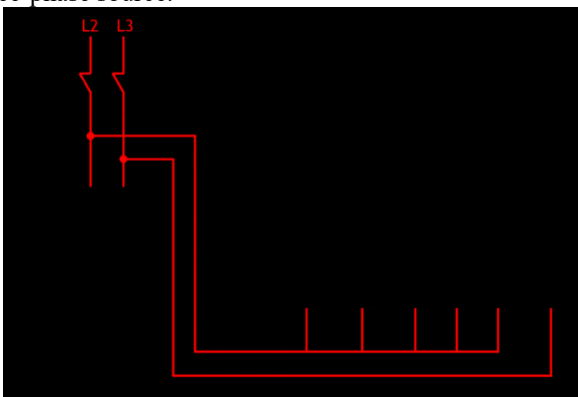


Figure 8. Power Delivery when the Device Experiences Single-Phasing in L1

A single-phasing scenario was also imitated by disconnecting the L2 of the three-phase power source and the equivalent circuitry. Since MC is also directly connected to L2, it immediately deenergizes which also disconnects the three-phase motor/load from the three-phase supply. Likewise, by disconnecting L3 of the three-phase source another single-phasing event was imitated. Only one device is connected in L3, that is, R2. With R2 deenergizes caused by power loss in L3, its normally open contact R2 that serves as the latching contact of MC and R1 then opens, thus also deenergizes MC and R1 and disconnecting the three-phase motor from the three-phase source.

The testing procedure conducted for the phase failure response of the device shows that no matter what causes the single-phasing of a three-phase source, either loss of power in L1, L2, or L3, the three-phase protection device will always respond by shutting down the system in order to protect the three-phase motor or any three-phase equipment connected to it. The test procedure had encountered no problems and functions well as conceptualized and theorized.

Actual Testing

In proving if the three-phase protection device is functional in terms of its circuit functionality and phase failure response, the device was confidently declared to function as it should be and was installed in the Institute of Agricultural and Biosystems Engineering (IABE) where a three-phase source

is available for the Ube Tech Dryer that runs using three-phase source. The three-phase protection device was installed between the three-phase source and the Ube Tech Dryer which will serve as the means of power delivery from source to the equipment when started and will interrupt the circuitry upon detecting single-phasing caused from any of the three lines to protect the equipment from overcurrent caused by overloading due to phase failure. The actual test set-up is shown in Fig. 9 and 10.



Figure 9. Three-Phase Protection Device installed in IABE



Figure 10. Three-Phase Protection Device Installed for UBE-Tech Dryer

After the three-phase protection device was installed for Ube Tech Dryer, the test procedures conducted was performed again to ensure that the device will perform its intended function in protecting the equipment as conceptualized. The test procedures performed in circuit functionality and phase failure response was again conducted with Ube Tech Dryer installed. Accordingly, the test activities were performed again. The single-phasing scenario was imitated by manually turning-off any single line (L1, L2, or L3) of the three-phase supply through the three-phase circuit breaker. The device still performed its intended function thus shutting down the entire device together with the equipment to protect it against overcurrent caused by overloading due to supply phase failure.

CONCLUSION

Providing phase failure protection to three-phase equipment using commercially and locally available materials that is economical yet reliable and effective is possible. By carefully analyzing and conceptualizing an appropriate design of electric circuit that will protect an equipment against single

phasing, the required function of the three-phase protection device against phase failure is achieved. The effectivity and reliability of the three-phase protection device is also reliant to the ratings and specifications of the components that must meet the standards set in the Philippine Electrical Code (PEC).

The development of the three-phase protection device is achieved by taking in consideration some factors such as quantity and specification of each component to be assembled. The rating of the components must be within the acceptable standards set in the PEC, specifically for protective devices, contactors, relays, and electrical wires to be utilized.

The intended function of the developed three phase protection device, that is to disrupt the power flow from three-phase source to the load, can be tested by assessing its equivalent circuit functionality and phase failure responses from various scenarios and events. These test procedures ensures that the developed device will always deliver its intended purpose to protect equipment from overcurrent caused by single phasing. In the event of irregularities and presence of plausible problems, appropriate adjustments and modifications must be conducted until the device's performance works as expected without compromise.

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Seismic Analysis of Diagrid Structure Using Buckling Restrained Braces as Secondary Bracings in Different Arrangements as Per IS 1893:2016

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Abstract

Modern infrastructure involves the construction of sustainable high-rise buildings for better utility, less carbon emission, and maintaining the ecological balance. Diagrid structural system is a recently developed system for high-rise buildings. In this system, inclined columns take up both axial and lateral loads, eliminating the perimeter columns and reducing the consumption of structural steel and providing efficient structural performance with excellent architectural flexibility and sustainability. Sustainability is proportional to the structure life, so there is a need to develop sustainable buildings that can last long. The recent studies on the Diagrid system reported insufficient energy dissipation capacity under high seismic loads. In this study, buckling restrained secondary braces are used to increase the seismic performance of the Diagrid structure. In the Buckling restrained braced system, the BRBs brace is restrained, and strength in compression and tension will remain unaffected. The core material in BRB is made of low yield steel-consuming high seismic energy while undergoing large plastic deformations simplifying the hysteretic property and ultimately increasing the energy dissipation capacity. 50 story high regular, C and L-shaped Diagrid buildings located in seismic zone 5 with different arrangements of BRBS as secondary braces were analysed using the response Spectrum Method in ETABS software as per IS 1893:2016. The results showed that secondary bracings of BRBs in X-arrangement significantly improved the seismic performance of the Diagrid structure, reducing the time period by 10%, displacement by 25% and maximum story drift by 20%.

Key words

Buckling restrained brace, Diagrid, Dynamic analysis, ETABS, Sustainability.

I. INTRODUCTION

The fast improvement of urban communities adds to an expansion in the metropolitan populace, and with the restricted land accessible, there is a need to develop tall structures. The prominent force that influences the design of tall buildings is the lateral load, primarily due to earthquakes and wind. Advances in primary designing, development techniques, accessibility of superior materials, and computational programming make designing complex-shaped tall structures conceivable. The design code provisions emphasise increasing the structure ductility. Thus, ductility and higher energy dissipation for earthquake-prone zones are necessary for tall buildings. Bracings in tall buildings are accepted worldwide because of their excellent aesthetics and lateral load-distributing capabilities. Many skyscrapers and their structural system install concentric, x-shaped, k-shaped and eccentric bracings. Recently advantages of bracings have been utilised, and diagonals are provided on the perimeter. In a Diagrid structure, the load is distributed by the members by the triangular configurations created by diagonal members combined with beams throughout the height. The load transfer mechanism of the Diagrid structure is axial conduct. The diagonals transfer gravity and horizontal load, increasing shear carrying

capacity, flexural rigidity, and making the building more redundant.

Along with the better load transfer mechanism Diagrid, the structural system gives excellent architectural flexibility such as perfect commodity, firmness, and delight. The Diagrid structure also utilises less structural steel than framed structures. According to the repetitive diagrid pattern, the Diagrid structure is modelled as a cantilever beam on the base and segmented heightwise into modules. The number of stories defines this module size.

A. Diagrid structure as Sustainable structural system

Abbaspoor and Behjo [1] studied that the particulate Matter (PM) and CO concentrations near the tall buildings and found significant pollution besides the building due to winds and eddy currents. There is a need to have more green vertical spaces and construct sustainable tall buildings. The sky gardens efficiently reduce pollution and energy. The temperature is maintained, i.e. colder in summer and warmer in winters, by absorbing the heat. The sustainability of a structural system for buildings can be assessed using life cycle assessments tools (LCA). The Diagrid structural system is a sustainable structural system having higher lateral stiffness. In this system, inclined columns take up both axial and lateral loads, eliminating the perimeter columns reducing the consumption of structural steel by 20% and energy by

25%, and significantly reducing overall carbon emissions compared to the conventional system [2]–[4]. This system also makes the accessibility of more open space inside the building. The sky gardens can be efficiently allocated in the Diagrid structures, reducing energy and improving sustainability. For encouraging green buildings and sustainable designs, the US council has established Leadership in Energy and environmental design (LEED). The LEED grants rating to the buildings on sustainability. The Hearst tower located in Newyork has been constructed using a diagrid structural system. This tower has obtained a gold rating from LEED for its sustainable design.

II. LITERATURE REVIEW

The preliminary sizes for diagonal members are calculated based on the stiffness approach by adopting the maximum displacement criterion, i.e. $u < H/500$ [5]. The extensive research conducted to find the optimum angle found that the optimum angle for Diagrid structures is between 60°–75°[5]–[10]. Studies on varying angle Diagrid showed that varying angles give efficient and more economical designs[11], [12]. Studies on Diagrid structure using Indian standards found that the Diagrid structure can carry horizontal and vertical load effectively. The interior vertical structural elements only need to be designed for gravity loads[1], [9], [13], [14]. The major problem is excessive story drifts and multi-story buckling modes. This problem was solved when secondary bracings were provided at the core of the building [13], [15]. The Diagrid structure also has a better resistance against progressive collapse, and the nonlinear analysis procedure for advanced failure gives more accurate results [16]. The irregular Diagrid buildings and different types of braced steel structures were analysed using response spectrum method according to Indian standards [17]–[19].

The problems associated with the Diagrid structural system are its inadequate ductility and energy dissipation capacity. During earthquakes, this limited ductility and energy dissipation capacity become critical under solid ground motion. As the primary diagonal members carry gravity and lateral loads besides higher stiffness, these diagonal members lose elasticity at certain deformations and start yielding resulting in inadequate strength, leading to global collapse. These limitations are very much eliminated when Diagrids are arranged as eccentric braces separated by link beams which act as fuse elements. Using time history analysis, Nasim & Zhang [20] analysed a 21 story Diagrid buildings with replaceable shear links as fuse elements. The results showed a significant increase in seismic performance. Dabbaghchian et al. [21] compared eccentric Diagrid and regular Diagrid structures using static and dynamic analysis. The results displayed that shear links are the first to yield, followed by secondary beams. The primary diagonal members remain within the elastic region, the mean roof displacement is reduced, and safety margins are increased. The Diagrid structural system is not a completely ductile system which affects its performance under highly seismic zones, and there is limited research on Diagrid structural system having structural irregularities. Also, the Diagrid

structural system display problems, i.e. the multi-storied buckling modes and extreme inter-story drift under seismic loads. The Diagrid structural system needs to be optimised for better energy dissipation. It requires a detailed analytical study for the optimal installation strategy of buckling restrained braces (BRBs) as secondary braces to attenuate the earthquake-induced energy Diagrid systems. In regular structures bracings effectively minimise the displacements and story drifts [22].

A. Buckling restrained braces

Earthquake and wind forces are the most prominent forces in the design of tall steel buildings. These lateral forces result in huge lateral deformations. However, the brace effectively minimises the lateral deformations but is relatively ineffective under large compressive forces, displaying buckling distortion. Ultimately showing an uneven hysteretic performance in tension and compression and characteristically showing a considerable loss in strength when monotonically loaded in compression or at regular intervals. In BRBs, the brace is restrained, and strength is conformed in compression and tension. BRBs simplify the hysteretic property and ultimately increase the energy dissipation capacity. Xie [23] illustrated the behaviour of a conventional brace and buckling restrained brace. In place of regular braces, buckling restrained braces (BRBs) are extensively used for seismic protection because of their increased energy dissipation capacity and resistance against lateral deformations. Sadeghi & Rofooei [24] utilised the advantages of BRBs and analysed a Diagrid structure having BRBs using time history analysis. The result showed a significant increase in seismic performance. Partial replacement of primary members with BRBs sections performed the best in diagrid structure under seismic loads. Lin et al. [25] compared the seismic performance with an outrigger system equipped with buckling restrained braces Fahaminia and Zahrai [26] combines the benefits of buckling restrained braces and shape memory alloys, modelled BRBs core with shape memory alloy. This configuration significantly reduced the residual deformations of the frames.

B. Brb configuration

BRB has four parts shown in fig.1:

- Brace unit which takes axial force
- Hardened transition part connecting brace with the connection
- Encasing part having a buckling-restraining Part which avoids the brace from buckling
- A debonding material or a gap is placed between the brace and BRB. This gap will help in proper sliding of brace inside buckling restraining part. Transverse expansion takes place when the brace gets yield under compression.

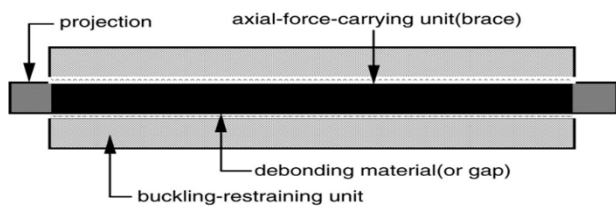


Fig. 1 Components of buckling restrained braces[23]

III. DETAILS OF BUILDINGS UNDERSTUDY

To increase the Diagrid structure's seismic performance, the benefits of buckling restrained braces are utilised in this study. Both regular and irregular buildings (I and C shaped) are modelled and analysed by conducting dynamic analysis in ETABS according to IS 1893:2016. The symmetric building is the square configuration with 48 m × 48 m having a core of 12m x 12m and an asymmetric structure with a C and L shaped plan. The decrease in plan area will result in plan irregularity, the L- shaped and C-shaped building models have plan irregularities. In the regular Diagrid building model the diaphragm is modelled as rigid and semi-rigid for plan irregular building. The codes used for the analysis are IS 1893:2016 and IS 800:2007. All the buildings are 50 stories tall with story height of 3.5 m. The building models are 175 m high. The live design load and dead loads are 5 kN/m² and 5 kN/m². The mass source of the building is 100 per cent for dead load and 50% for the live load. The structure is analysed for lateral load due to earthquake considering a seismic factor of 0.36 (zone V), soil type of medium, zone factor of 0.36, response reduction factor of 5, and structure importance of 1.5 factor as per IS 1893:2016. The steel and concrete grades are Fe 345 and M30, respectively. The damping ratio is 5%.

A. Modelling details

For all regular, C-shaped and L-shaped Diagrid structure models, the steel material used for beams, columns and diagonal members is Fe 345 (F_y=350N/mm²). The sections used for the diagonal members are 700mm x 700mm x 18mm steel pipe sections. The interior columns are of steel tube section of 600mm x 600mm x 16mm. The frame beams sections used are ISMB 550. The diagonal beams are of build-up sections of ISWB 600 having cover plates of 250mm x 50mm on both sides. The slab material is concrete of grade M30 and thickness is 125 mm, and steel material used for buckling restrained braces is Fe 250 and star seismic BRBs from ETABS predefined sections a section of Star seismic 31.5 is used. The columns are of steel tube section of 600mm x 600mm x 16mm.

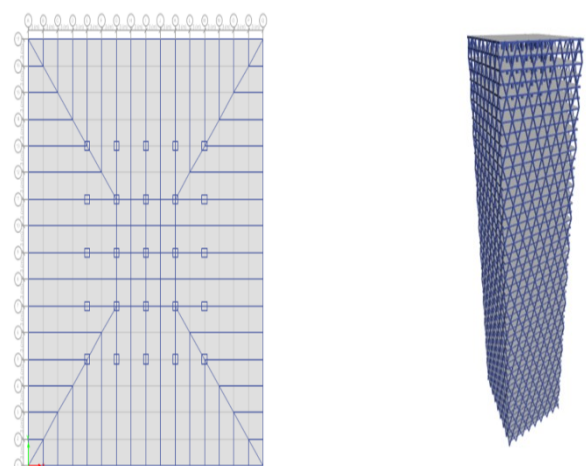
The models considered in this study are shown below:

1. Regular diagrid structure- (RDS)
2. Diagrid structure with diagonal buckling restrained bracings as secondary bracings (RDS-D-BRB)
3. Diagrid structure with v buckling restrained bracings (RDS- V-BRB)

4. Diagrid structure with x buckling restrained bracings (RDS-V-BRB)
5. Diagrid structure with eccentric buckling restrained bracings (RDS-E-BRB)
6. Diagrid structure with inverted v buckling restrained bracings (RDS-IV-BRB)
7. L-shaped diagrid structure (LDS)
8. L-shaped diagrid with diagonal buckling restrained bracings (LDS-D-BRB)
9. L-shaped diagrid with v-buckling restrained bracings (LDS-V-BRB)
10. L-shaped diagrid with x-buckling restrained BRACINGS (LDS-X-BRB)
11. L-shaped diagrid structure with eccentric buckling restrained bracings (LDS-E-BRB)
12. L-shaped diagrid structure with v - buckling restrained bracings (LDS-IV-BRB)
13. C-shaped diagrid structure (CDS)
14. C-shaped diagrid structure with diagonal buckling restrained bracings (CDS-D-BRB)
15. C-shaped diagrid structure with v - buckling restrained bracings (CDC-V-BRB)
16. C-shaped diagrid structure with x - buckling restrained bracings (CDS-X-BRB)
17. C-shaped diagrid structure with eccentric - buckling restrained bracings (CDS-E-BRB)
18. C-shaped diagrid structure with inverted - buckling restrained bracings (CDS-IV-BRB)

B. 3d model, Plan and elevations of models

The views of regular Diagrid structure are shown in fig 2.



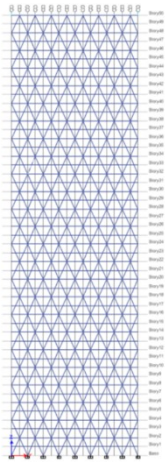


Fig. 2 (a) Plan, 3d model and Elevation of the regular Diagrid structure

The placement of the secondary bracing system for regular diagrid structure- (RDS) is shown in fig. 3

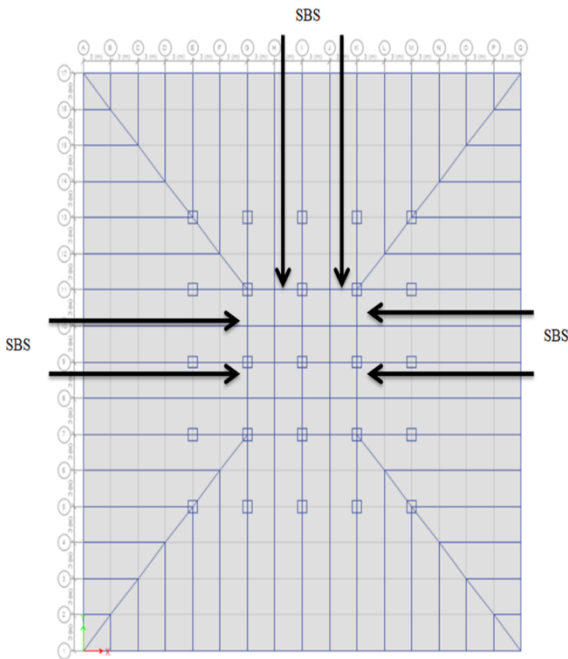


Fig. 3 Plan to show the location of secondary bracing system in regular Diagrid structure (RDS)

The arrangement of different types buckling restrained braces for regular Diagrid structure is shown in fig. 4

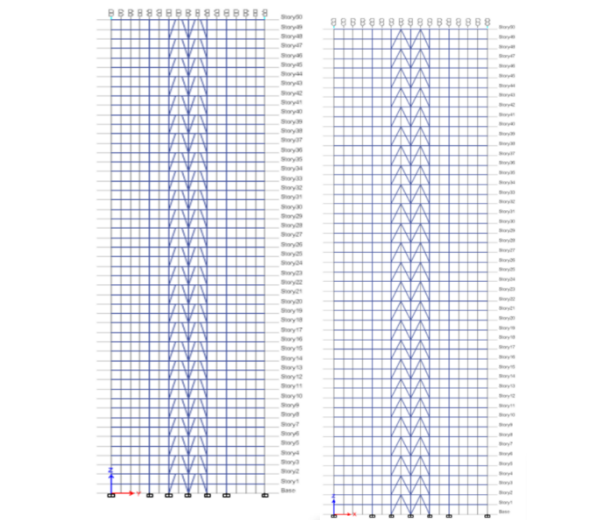
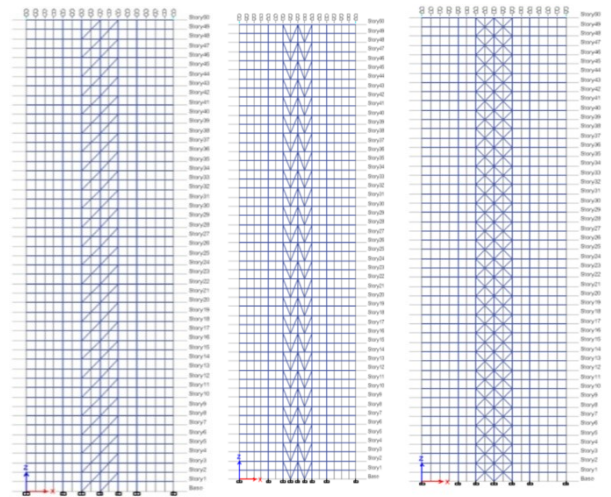


Fig. 4 Elevations showing the different arrangements of the secondary bracing system

The Plan and 3d model of L shaped and C shaped Diagrid structure is shown in fig. 5 and fig. 6. The location of the secondary bracing system for the L and C shaped diagrid system is shown in fig. 7.

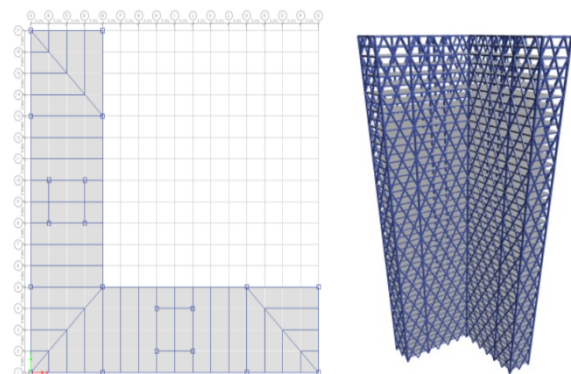


Fig. 5 Plan and 3d model of L shaped diagrid structure

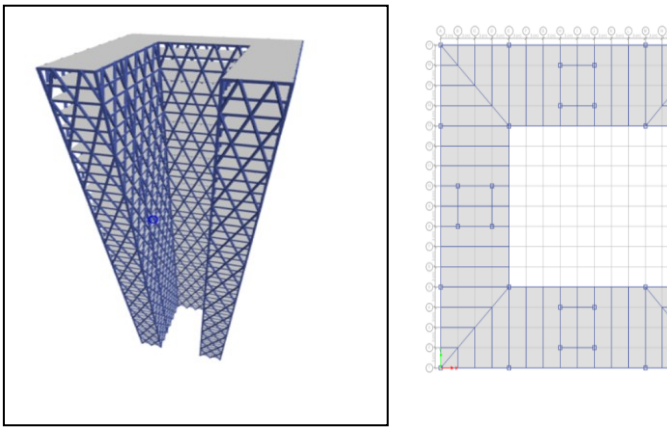


Fig. 6 Plan and 3d model of C shaped diagrid structure

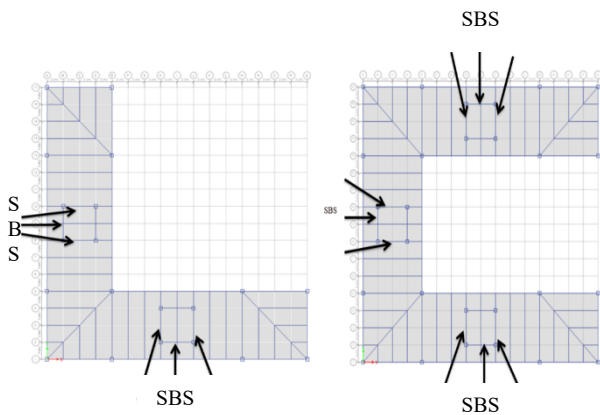


Fig. 7 Plan showing the location of the secondary bracing system for L shaped and C shaped diagrid structure

IV. SEISMIC ANALYSIS OF THE BUILDINGS UNDERSTUDY

The response spectrum analysis method is used to calculate and estimate the response of the structures under dynamic loadings. These dynamic loadings result from earthquakes and other violent shakings that last for a short duration and are primarily non-deterministic and transient dynamic events. The response spectrum method is founded on a particular form of superposition mode. The main indication is to provide a response that offers a limiting value for exactly how much an Eigen mode has a specific natural frequency, and damping can be agitated by a dynamic event.

In this study, response spectrum analysis as per IS 1893:2016 is used for the dynamic analysis. The research is performed using ETABS, and results of time period, story drift, base shear and story displacement are calculated and interpreted.

A. Time period

The sideways action causing the building to move front and backwards is the fundamental mode and will determine the structural response. The time taken to complete first mode shape is the time period. This usually depends on the mass and stiffness of the structure. The graph in Fig. 8 shows the

time period value for RDS. Fig. 9 for L shaped and fig. 10 for C shaped diagrid models. The results show a significant decrease in the time period with buckling restrained braces as secondary braces. The time period is maximum for regular-shaped diagrid and minimum for C shaped. All the arrangements of the secondary bracing system reduce the time period. The X arrangements performs the best and reduce the time period by 10% for regular Diagrid structure, 8.4% for L shaped, and 4% for C shaped Diagrid system.

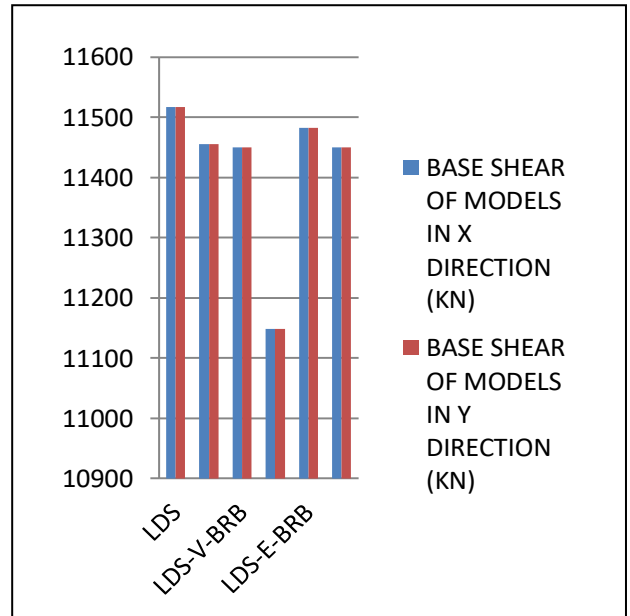


Fig. 8 Time -period for regular-shaped Diagrid having different configurations of BRBs as SBS

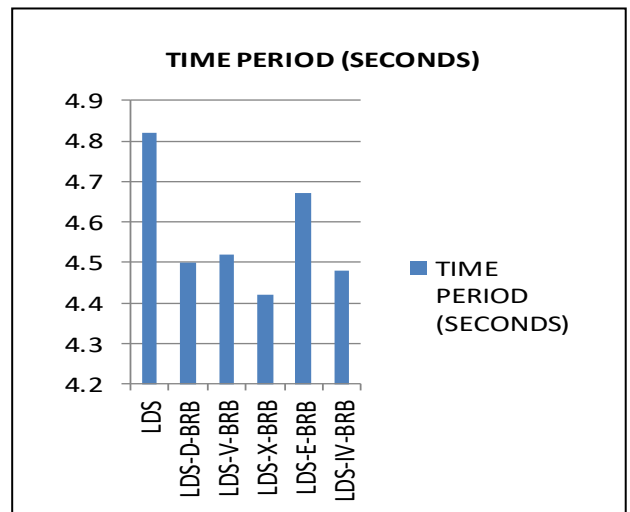


Fig. 9 Time -period for L-shaped Diagrid having different configurations of BRBs as SBS

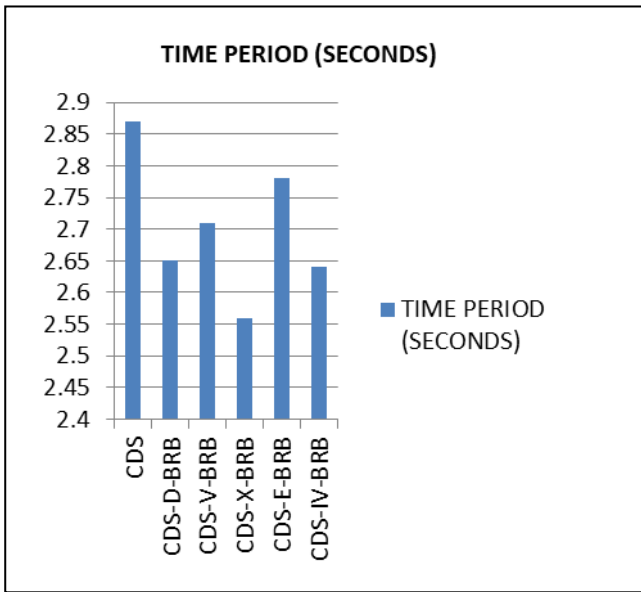


Fig. 9 Time -period for C-shaped Diagrid having different configurations of BRBs as SBS

B. Base shear

The graphs shown in Fig. 10, 11 and 12 shows the base shear value for regular diagrid, L shaped and C shaped diagrid respectively. The value of the base shear is maximum for regular Diagrid structure and minimum for C shaped Diagrid. It is observed that with the introduction of BRBs as the secondary bracing system the base shear value decreases, and the X bracing system is more efficient, reducing the base shear for all the models.

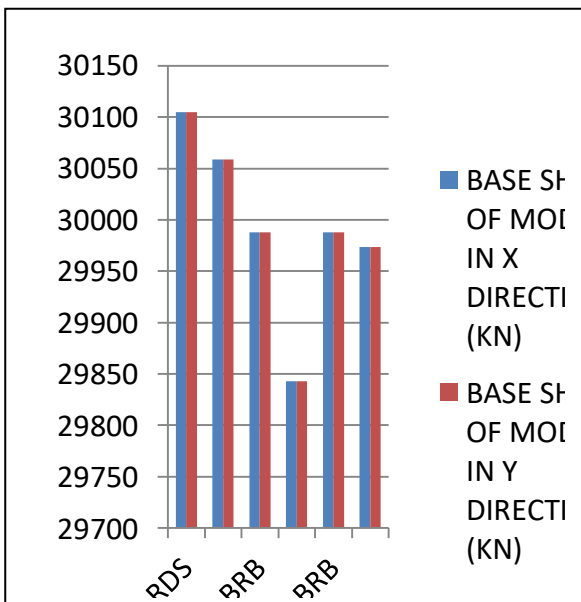


Fig. 10 Base shear for regular Diagrid having different configurations of BRBs as SBS

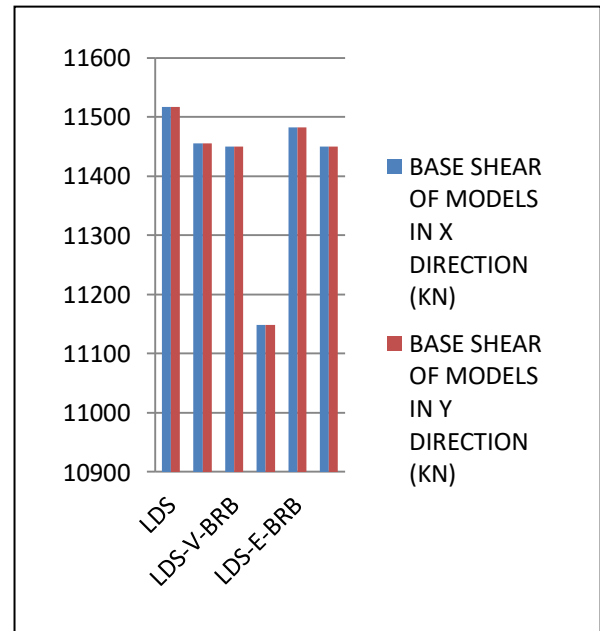


Fig. 11 Base shear for L- Diagrid having different configurations of BRBs as SBS

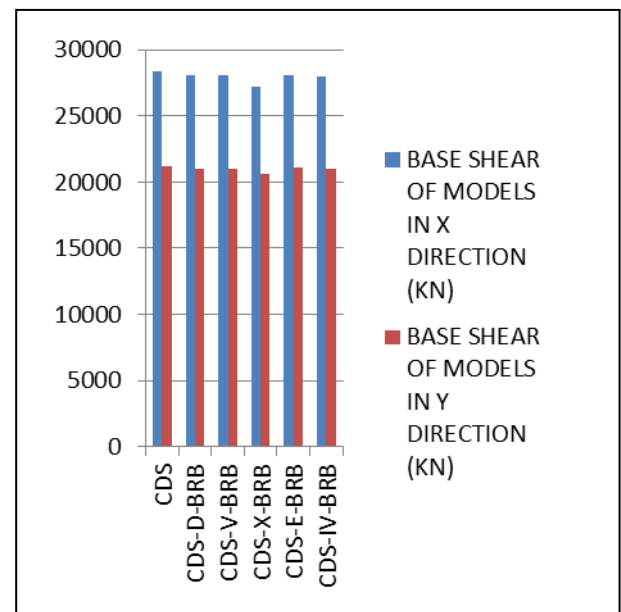


Fig. 12 Base shear for C- Diagrid having different configurations of BRBs as SBS

C. Maximum displacements

Maximum displacement is the total horizontal displacement of the structure in relation to the base of the building. The graphs shown in Fig. 13, 14 and 15 shows the base shear value for regular diagrid, L shaped and C shaped diagrid respectively. From the analysis, the maximum displacement is maximum for C shaped Diagrid and over the limit of H/500 as prescribed by IS 800:2007. The L shape has minor displacement. It is observed that with the introduction of BRBs as the secondary bracing system, the value of the displacement decreases, and the X bracing system is more efficient, reducing the displacement by 25% for regular

Diagrid structure, 15% for L shaped, and 12% for C shaped Diagrid system.

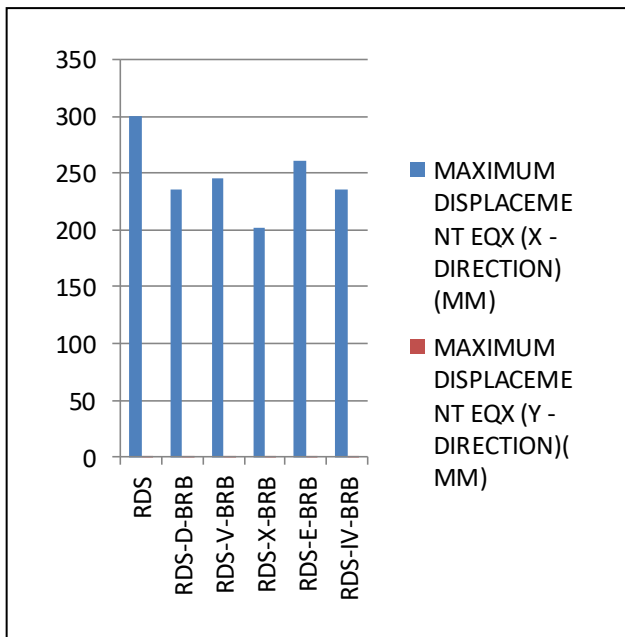


Fig. 13 Base shear for regular Diagrid having different configurations of BRBs as SBS

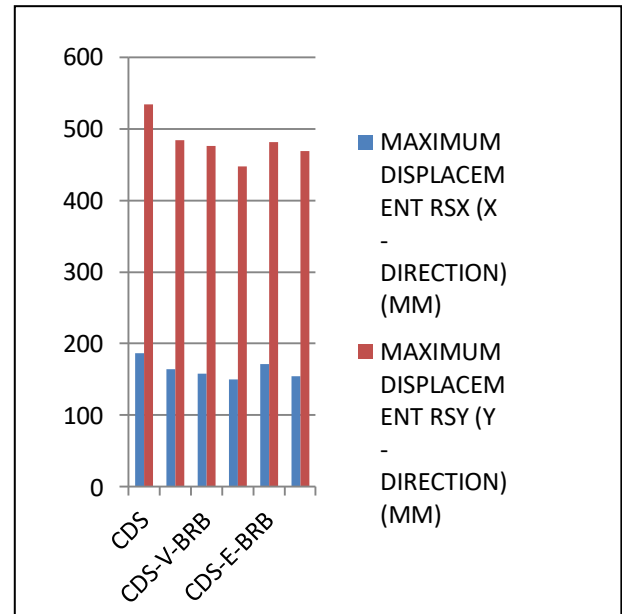


Fig. 15 Base shear for C-shaped Diagrid having different configurations of BRBs as SBS

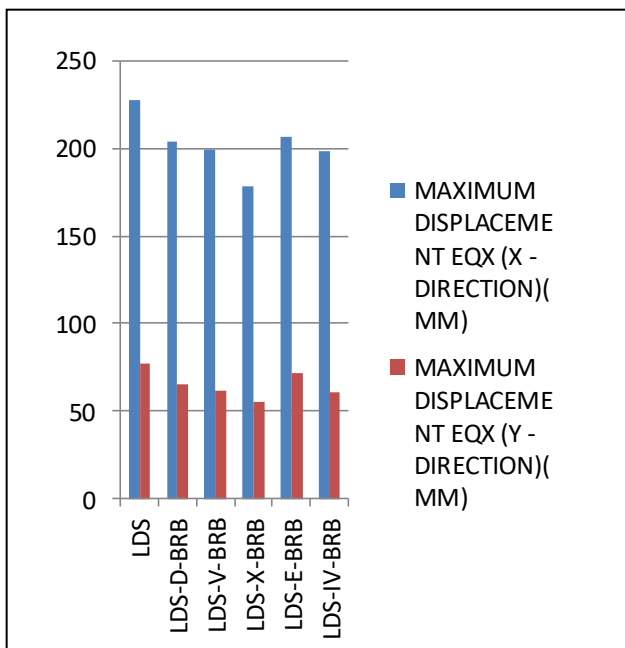


Fig. 14 Base shear for L- shaped Diagrid having different configurations of BRBs as SBS

D. Maximum inter-story drift

The graphs shown in Fig. 16, 17 and 18 shows the base shear value for regular diagrid, L shaped and C shaped diagrid respectively. the regular Diagrid structure has maximum story drift as compared to L and C shaped. The value of story drift is higher for C shaped and lower for L-shaped Diagrid. With brbs in X arrangement as secondary bracing reduces the maximum drift by 20% for regular Diagrid structure, 8% for L-shaped Diagrid, and 14.5% for C-shaped Diagrid structure. This arrangement is the most efficient as compared to other arrangements.

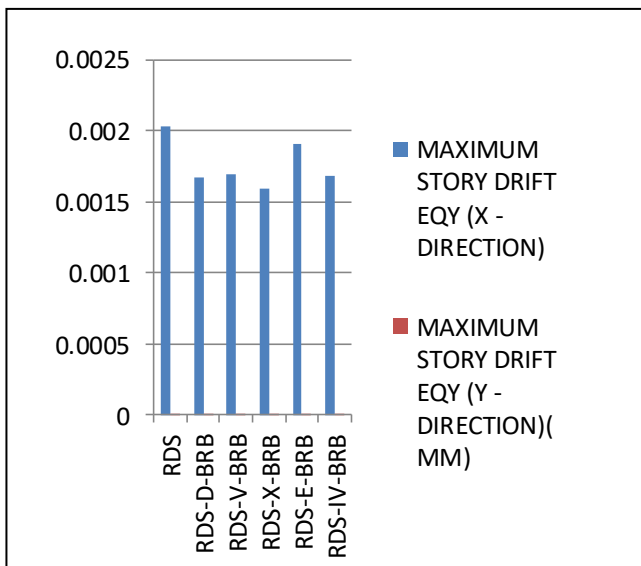


Fig. 16 Story drift for Regular Diagrid structure having different configurations of BRBs as SBS

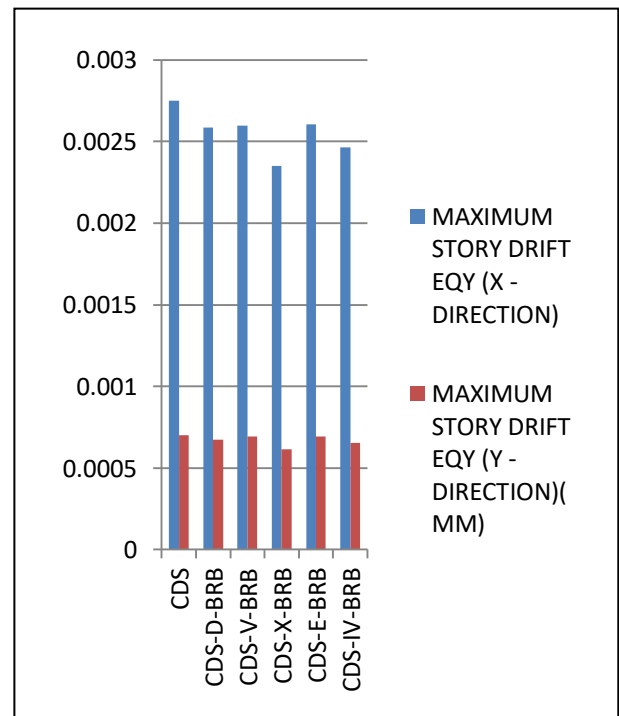


Fig. 18 Story drift for C-shaped Diagrid structure having different configurations of BRBs as SBS

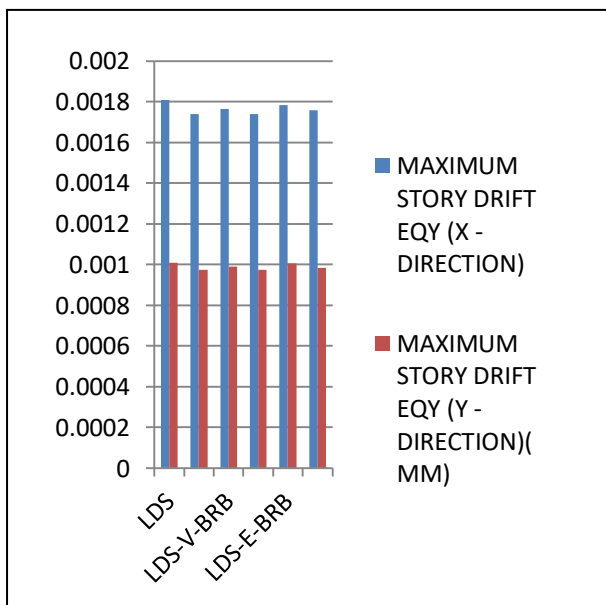


Fig. 17 Story drift for L-shaped Diagrid structure having different configurations of BRBs as SBS

V. V. CONCLUSIONS

This study presents the perspective of buckling restrained braces to increase the seismic performance of the 50 story regular and irregular Diagrid structures by providing buckling restrained braces and finding the most effective arrangement of BRBs to resist the seismic loads. The following are conclusions of this study:

1. The diagrid structural system is a sustainable system for tall buildings. With the introduction of BRBs as secondary bracings, the seismic performance of regular and irregular diagrid structures is increased significantly.
2. The performance of C shaped Diagrid structure is the poorest, having higher displacements and story drifts.
3. The time period is reduced with the introduction of BRBs. The X arrangement performs the best reducing the time period by 10% for regular Diagrid structure, 8.4% for L shaped, and 4% for C shaped Diagrid system.
4. The value of base shear should be minimum as the structure with increased base shear will attract more horizontal forces and be subjected to more damage during a seismic event. The base shear is maximum for regular Diagrid structure and minimum for C shaped Diagrid.
5. The L shape has minor displacement and with the X bracing system of BRBs the displacement is reduced by 25% for regular Diagrid structure, 15% for L shaped, and 12% for C shaped Diagrid system.

6. Inter-story drift is the story displacement in the lateral direction between the successive stories divided by the story

height. The story drift is found to be maximum for C shaped and minimum for L-shaped Diagrid. With BRBs in X arrangement as secondary bracing the maximum drift is reduced by 20% for regular Diagrid structure, 8% for L-shaped Diagrid, and 14.5% for C-shaped Diagrid structure.

7. The performance of BRBs in the diagonal, V, inverted V and eccentric arrangement are significantly lower than the X arrangement, the eccentric arrangement is most inefficient, slightly reducing the displacements and drifts by 6%.

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A Study on Impact of Emotional, Leadership & Managerial Competencies on Project Stakeholder Management

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Abstract

Project Stakeholders are those people, group or institutions who may affect, can be affected by or perceive itself to be affected by a decision, activity or outcome of a project. While the Stakeholder analysis creates and abridges information about all the people, group, organization and institutions involved in one way or another by the future project. The goals and objectives of the stakeholders are always depended on the type and size of the project. And the impact of these stakeholders is always recognized by the competent project leader. While some stakeholders may have a limited ability to influence the project, others may have significant influence on the project and its expected outcomes. This study indicates the ability of the project manager to correctly identify and manage these stakeholders in an appropriate manner can mean the difference between success and failure. The management of project stakeholders involves the process of identifying, analyzing expectations, developing the appropriate management strategies to effectively mobilize by involving them in project decisions and implementation. The study highlights the project manager's competencies which are needed to understand the needs of the stakeholder and also showcase the how the emotional intelligence plays a key role while managing the stakeholder of the project.

Key words

Emotional Intelligence, Project Manager's Competencies, and Project Stakeholder Management

I. INTRODUCTION

An ineffective undertaking brings about misfortunes to project stakeholders. Deplorably, numerous projects neglect to be finished within their, plan, budget limits, along these lines guaranteeing the ideal quality and fulfillment of all stakeholders in the development business.

A project is one time effort to change things in certain way. Whereas Project management refers to the application of knowledge, skills, tools and techniques to project activities to meet project requirements.

Emotional Intelligence is one of the project management skills generally called soft skills, that is, those skills of an interpersonal nature as opposed to those skills identified in A Guide to the Project Management Body of Knowledge (PMBOK), which are generally of a more technical nature and are often referred to as hard skills.

Stakeholders are generally an Internal and external people, group or an organization who are social and economic partners of the company who are influenced by the company's activity as the company is accountable to all parties who has some interest and the company must consider the opinions of the stakeholders. Here the Project Stakeholders are those people, group or institutions who may affect, can be affected by or perceive itself to be affected by a decision, activity or outcome of a project.

While the Stakeholder analysis creates and abridges information about all the people, group, organization and institutions involved in one way or another by the future project. The goals and objectives of the stakeholders are always depended on the type and size of the project. Ant the impact of these stakeholders is always recognized by the competent project leader.

The various theories of Project Stakeholder Management indicates that "Every project will have stakeholders who are impacted by or can impact the project in a positive or negative way." "While some stakeholders may have a limited ability to influence the project, others may have significant influence on the project and its expected outcomes." "The ability of the project manager to correctly identify and manage these stakeholders in an appropriate manner can mean the difference between success and failure." The management of project stakeholders involves the process of identifying, analyzing expectations, developing the appropriate management strategies to effectively mobilize by involving them in project decisions and implementation. With regard to the human side of project management, much has been highlighted on identifying the skills, technical expertise, attributes, and qualities required for a successful project manager.

The project manager's role as leader is not reactive, but rather a proactive one. Project managers do require having the requisite skills to lead their subordinates, which facilitates

workers in achieving the project goals. As leader, a project manager must know and satisfy people's needs; understands what drives people; and promotes their interests while pursuing the project's objectives. Further, to manage the conflicts, it is required for a Project Manager or leader to be aware of his or her strength and weakness. It is correctly said that human behavior is the most interesting part of management but it is also the most challenging. This requires project managers to display effective leadership qualities in order to lead their team members toward the achievement of desired performance. Transformational leaders as those who inspire their subordinates and provide intellectual challenges. The role of project managers' competencies along with organizational competencies is vital in improving project performance. Some knowledge, skills, and abilities have emerged as especially relevant to the success of all projects, regardless of project size or complexity; these include participation, documentation, implementation, and development, maintenance of quality assurance processes, critical thinking, project reviews, communication, leadership, and flexibility.

II. LITERATURE REVIEW

(Goleman, 1998) highlighted that "effective leaders are alike in one crucial way: they all have high degrees of emotional intelligence." He argued that effective leaders possess the ability to employ the suitable type of leadership for the dominant situation in the organization. In Addition, the emotionally intelligent senior managers perform their jobs better compared with their peers with lower emotional intelligence. (Carmeli, 2003). (Yaozhong Liu, Yudan Jing, 2015), Transformational leadership is measured with four sub-scales; namely: idealized influence, intellectual stimulation, inspirational motivation, and individualized consideration. The study shows that project managers with high emotional intelligence who bear the desired competencies and exhibit transformational leadership behavior are effective leaders and ensure higher success in projects than their counterparts.

(William Leban, 2004) "Transformational project management" can be accomplished by having results-focused project managers (via inspirational motivation, in other words, emotional intelligence) rather than those who are activity focused as in the case of transactional project managers. To support this, (Vanessa Urch Druskat, Gerald Mount, 2005) assessed the skills related to the success of project managers in 74 international petroleum corporations, and found that, of all the skills that contributed to project managers' success, 69% were the emotional competencies (self-confidence, influence, achievement orientation, teamwork, and coordination); 31% were business expertise; whereas there was none (0%) in the area of cognitive skills, such as conceptual or analytical thinking. In addition, (Baker, 2012) represented various challenges presented to the project leaders while setting and managing stakeholder expectations. In addition, the stakeholder management strategy developed and the output of these processes will lead directly to the development of an effective communication management plan, our plan to keep project stakeholders informed regarding project status, progress, and forecasts. And

(Vierimaa 2013) Research reported in this thesis conducted interviews with project managers and found that the majority of those interviewed believed emotions played an important part in leadership.

(Pattanaik, A. 2014) the study shows that the Proactive measures by the project manager to mitigate risks and create a culture of effective communication among stakeholders and team members are valuable factors in achieving project success. A good project leader recognizes the key impact that stakeholders can have both to help and to hinder the progress of the project. Careful stakeholder analysis and a careful communication plan will maximize the project's chances of delivering deliverables on time and in budget. The management and communication strategies to be adopted for each type of stakeholder will be detailed in future works. (Youssra 2017). (Andrew, 2018) The researcher has found the complexities in managing stakeholder engagements have led some life sciences companies to consider novel approaches like working with third parties. It is important to note, however, that, in all cases, stakeholder engagement requires an investment of both time and resources, including the active involvement of senior leadership at a company.

III. RATIONALE OF THE STUDY

The purpose of this study is to provide the Project managers/Project Leaders an approach for managing the Stakeholder of the project. The project stakeholder can be the end-to-end users, top managers, board of directors or the bottom-line workers or the people who will have some benefits from the project. To manage such stakeholders, the managers should have certain skills and competencies which can help him/her to serve in a better way. This study will provide those core competencies to help the managers for effective decision making. The current study focuses on the Emotional, Leadership and Managerial aspects of the competency which can affect the manager/leader.

A part from the three major variable, the study also provides the other factors which can affect the project stakeholder management. The study will be helpful in implementing the project charter. The project charter is a document containing all the necessary items of the project, including the stakeholders. In addition, the study also aims to provide support to the entrepreneurs in the field of project management. The competencies mentioned in this study will help the entrepreneur for building the business plan in such a way where the stakeholders' needs can be satisfied.

IV. RESEARCH GAP

The previous studies are limited to the project success rate, while the project leader may identify the perception of the stakeholder towards the different projects. Moreover, there are various competencies which affect the project stakeholder management. These competencies are divided into three major groups i.e., Emotional, Managerial and Leadership Competencies.

Other than that, the stakeholders are the people in general can be of bottom-line workers or can be the top managers or the silent partners or can be the end users. And to manage those stakeholders, the project manager or the project leader should

have certain skills and competencies which can help him/her for the process of management of stakeholders.

V. OBJECTIVES

To study the relationship between Emotional, Managerial and Leadership Competencies.

To study the competencies affecting Project Stakeholder Management.

HYPOTHESIS

H0: There is no significant relationship between Individual's Age/Gender/Work-experience/Designation and the competencies.

H1: There is a significant relationship between Individual's Age/Gender/Work-experience/Designation and the competencies.

VI. RESEARCH MODEL

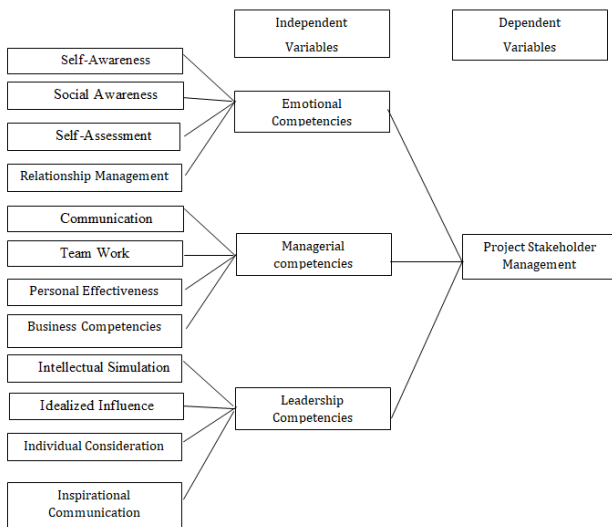


Figure 1: Research Model

VII. RESEARCH METHODOLOGY

In this study, the Project Stakeholder Management is depended on the various Competencies i.e., (1) Emotional Competency, (2) Managerial Competency and (3) Leadership Competency.

The quantitative data have been collected though the survey method and analyzed by using the Inferential Statistics in the SPSS.

Type of research

The Primary research have been Carried out to collect the Data for the analysis. The nature of the research approach is quantitative in nature because it ensures the authenticity and reliability of the sample information selected for this research.

Source of Data

In the initial Stage, to provide evidences to the definitions, the existing literature (Books and Articles) Have been used. And the Primary data have been originated by the researcher.

Methods of data collection

The main Instrument used for the research was Questionnaire. The Quantitative data have been collected through a survey type questionnaire. The questionnaire was self-designed by the researcher based on the objectives and the research model.

Sampling plan

The population of the study consisted of the all the Managers having work experience of 0-15 years. The sampling size for this research is 177. Moreover, the simple Random Sampling Method have been used.

VIII. DATA ANALYSIS AND RESULTS

The Primary data collected from survey have been analyzed using Statistical Package for the Social Science (SPSS).

Descriptive Statistics

It is used to describe a sample or help in summarizing data in more meaningful way. It consists of the collection, organization, Summarization, presentation of data. It is displayed as tables, charts, percentages, frequency, distributions and reported as measures of central tendency (the sample mean, mode, median), Measures of Position, Measures of variability (range, variance, standard deviation). It enables you to identify associations among variables, thus making you ready to do further statistical analysis.

Frequency and Percentage Distribution is calculated for all the variables under demographic profile for the study undertaken and Interpretation of the variables observed are as follow:

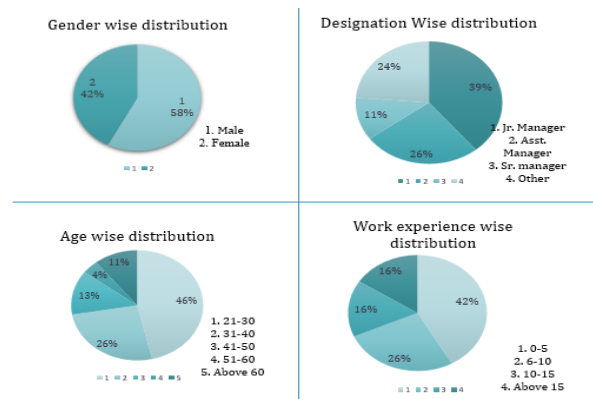


Figure 2: Pie chart of distribution of Demographic Data

The above-mentioned graphs showcase the descriptive analysis of the demographic details. Here, the 58% of the respondents are male and the remaining are female. In case of Designation, the majority of the population are Jr. Manager and Assistant manager with work experience of 5-10 years at the age of 20 to 40.

The Likert scaled data shows the scale of strongly disagree to strongly agree. Approximately 68% of respondents have opted agree and strongly agree option in the questionnaire which indicates that most of the people agree to the given scenario. On the other hand, some of the respondents have been seen to be neutral for the questions like "I can easily say No" and a more importance has been observed for the competencies such as communication in the field of project management.

Inferential Statistics

b1. Chi-square test

Objective

To study the impact of individual's Age/Gender/Work-experience/Designation on the competencies.

Chi-square analysis was used to identify the relationship between the three competencies.

Hypothesis:

H0: There is no significant relationship between Individual's Age/Gender/Work-experience/Designation and the competencies.

H1: There is a significant relationship between Individual's Age/Gender/Work-experience/Designation and the competencies.

Output:

The significance value of the test is 0.045 which indicates that there is no sufficient evidence to justify which can reject the alternate hypothesis. Hence, the Null hypothesis is rejected and it is identified that there is a relationship between the demographic variables i.e., Age/Gender/Designation/Work Experience and the Competencies while considering the Project Stakeholder Management.

In case of Gender there was no sufficient to justify the relationship with the Competencies.

Where as in case of Age, Designation & Work experience the difference have been observed.

b2. Factor Analysis

Objective

To identify the competencies affecting Project Stakeholder Management

Factor Analysis is used to identify the major Factors affecting Employees Turnover. Following steps were taken to conduct the Factor Analysis.

List of newly Identified Factors

Table 2: List of newly identified factors

Factor Labelling	Variable Details	Loading
Factor 1 Team Management Competencies	I am open to candid feedback, new perspectives, continuous learning, and self-development	0.632
	I model team qualities like respect, helpfulness, and cooperation	0.578
	My co-workers and I have a good working relationship	0.595
	At certain Point, a leader should go for the informal approach for the casual communication regarding the project.	0.54
	I think beyond the self Interest for the good of the stakeholders	0.581
	I have an ability to lead teams and be a team member who can share work leadership.	0.544
	Open to new ideas and approaches	0.62
Factor 2 Decision Making Competencies	I express confidence, decisiveness and optimism about the vision and its implementation	0.53
	Ability to communicate with stakeholders	0.619

Table 1: Sampling Adequacy

Kaiser-Meyer-Olkin Value	0.928
Total Variance (7 Factors: Eigenvalue>1)	62.22

Sampling Adequacy:

The Sampling Adequacy have been analyzed by Kaiser-Meyer-Olkin test. The Kaiser-Meyer-Olkin (KMO) test tells us whether or not enough items are predicted by each factor. Here the value resulted is .928 which is sufficient indicating that the sample is adequate. The Bartlett test of Sphericity indicated the Chi-Square value (8380.814) was significant at 1770 degree of freedom.

Scree Plot:

All 60 items of the research questionnaire were factor analyzed using Principal Component Analysis method followed by Varimax Rotation. The solution resulted in 7 factors with eigenvalues >1. The Total Variance Explained for the seven factors is 62.22%.

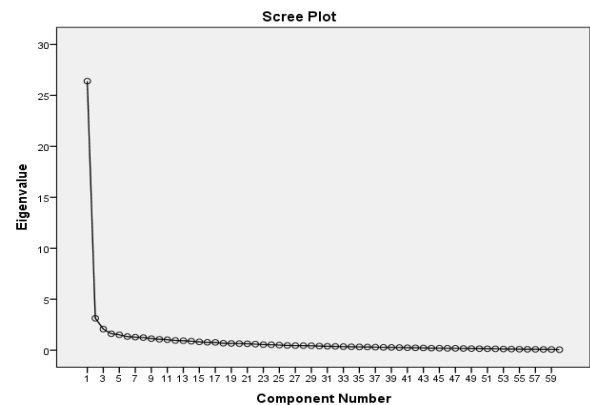


Figure 3: Scree plot (Factor Analysis)

	Ability to gain, use, and disseminate knowledge to oneself, team members, and others	0.637
	Importance of Building a team and managing a team	0.556
	Resolving Conflicts	0.628
	Complete the project on time	0.716
	Making Decision	0.503
Factor 3 Being Proactive	I respect and relate well to people from varied backgrounds	0.545
	I listen well, seek mutual understanding, and fully welcome sharing of information	0.6
	I spot and nurture opportunities for collaboration	0.626
	I cultivate and maintain extensive informal networks	0.578
	I encourage the stakeholders	0.602
	I respond the changes proactively.	0.579
Factor 4 Commitment Competencies	I always know which emotions I am feeling and why	0.558
	I am decisive, and able to make sound decisions despite uncertainties and pressures	0.62
	I treat one as an individual rather than just considering them in a group of beneficiaries	0.532
	I establish the steps which are needed to ensure projects are completed on time	0.549
	Committing to understanding other team members by assessing their behavioural competencies.	0.701
	Willing to change to meet evolving needs and unexpected demands	0.599
Factor 5 Conflict Management Competencies	I usually accurately read situations and organizational and external realities	0.634
	I can use different leadership styles that are situation specific to achieve high performance of the project.	0.54
	Ability to utilize multiple communication modes and channels.	0.514
	Managing Conflicts	0.628
Factor 6 Problem Solving	I handle difficult people and tense situations with diplomacy and tact	0.542
	I see working with difficult people as simply a challenge to win them over	0.502
	It is difficult to say “No” to a client	0.761
	I find the root of the problem and provide a unique solution to it	0.513
	Ability to negotiate	0.771
	Ability to meet Project Objectives	0.692
Factor 7 Information seeking competencies	I am open about sharing my curiosity for new things to solve problems	0.635
	Listening skills	0.717
	Understanding the organizational culture and managing the influences to achieve the objectives	0.628
	Willingness and ability to work with others to achieve shared success	0.569

IX. LIMITATIONS OF THE STUDY

The study has analyzed limited number of respondents and have focused all the managers, but to have a better output it is advisable to focus on the particular group of people for

instance Project Managers or the Entrepreneurs. And the sample size should be large so that the varied opinions can be collected. Moreover, a case-based analysis can also help to identify the mindset of people.

X. MANAGERIAL IMPLICATIONS

The study will be helpful in implementing the project charter. The project charter is a document containing all the necessary items of the project, including the stakeholders. In addition, the study also aims to provide support to the entrepreneurs in the field of project management. The competencies mentioned in this study will help the entrepreneur for building the business plan in such a way where the stakeholders' needs can be satisfied.

XI. CONCLUSION

The literature review highlights a number of approaches used in developing an understanding of the leadership skills and competencies required in project management, one of which was Emotional Intelligence.

Researcher have empirically framed hypotheses that emotional intelligence, project managers' competencies, and their transformational leadership styles have direct positive impacts on Dependent Variable.

The Study identified the relationship between the Emotional, Leadership and managerial Competencies and the Project Stakeholder Management. Moreover, the study also indicates the others competencies which can affect the project stakeholder management.

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The Influence of Commercial Space Utilization on Residential Area: A Case of Study of The Education Area of Kartika Street Kentingan in Surakarta City

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Abstract

The Education Area of Kentingan in Surakarta City has a function as a new growth center. The area has implicated the development of commercial activities in the surrounding area, especially in the area of Kartika Street. The purpose of this study is to find out commercial activities effects from how to transform settlement space utilization in the area Kartika Street. Quantitative method will be applied with spatial analysis and quantitative descriptive technique that uses primary and secondary data. The subject of this research is commercial in the area of Kartika Street. The results of the analysis showed a comprehensive phenomenon of space utilization of settlement spaces into commercial in the education area and finding 4 factors formed that affect in space utilization, namely higher education factors, location factors, accessibility factors, as well as economic factors.

Key words

space utilization; commercial activities; education area

I. INTRODUCTION

The development of an area can be influenced by the population, community activities, and community needs. Residents are the lifeblood of a city because of their needs and activities as a trigger for the development of a city. Population growth and increased activity have an impact on increasing space requirements (Widowati & Wijaya, 2014). The increasing number of residents in an area will demand service activities to meet the needs of daily life (Scott, 2006). The existence of developments in an area becomes an attraction for residents to migrate to other places. Therefore, an area that is experiencing development can increase the density in an area.

The increasing population density in an area will affect the availability and demand for land. In this case, changes in spatial use will result in many changes from certain land to other land uses caused by economic developments and population dynamics which always increase every year. (Weng, 2002). According to Cullingworth & Caves (2013), The factors that influence land use change are the concentration of population in all their activities, accessibility to activity centers and city centers, road networks and the availability of infrastructure. On the other hand, Verburg & Veldkamp (2004) said the use of the surrounding land can affect changes in land use and the development of social and economic activities of urban residents in the future. Such events are common in big cities which provide facilities to fulfill daily life without having to look elsewhere.

Higher education is an example of an institution in an urban area that has existed for a relatively long time, and has a dominant influence in the development of an area. The existence of higher education institutions, with their staff and students, demands the existence of facilities by both the local government and the private sector, but also has an influence on cultural, social, scientific and economic development. (Rudiarto et al., 2015). If this condition can be achieved, then both cities and universities can complement each other so that mutually beneficial relationships can be created.

Education area is an area that has implications for the socio-economic development of the community and affects the physical development around the area (Wardhana & Haryanto, 2016). The existence of universities will have an impact such as the emergence of land use change, especially non-built land into built-up land, especially in mixed building functions. Along with the development of the area, it will cause the conversion of land into built-up land to be out of control (Shankar & Vidhya, 2013). These changes will also affect physical, social and economic development. In the end, development in growth centers such as educational areas will spread and form a spatial pattern (Kumar & Sangwan, 2013). The driving factor that accelerates development in the educational area is the demand for student needs. Demand for community needs will encourage commercial activities. This shows that the development of the democratic system of society in its survival, including in the economic field. If it is related to the demand for student needs, this influence can be seen from the emergence of commercial activities in the form of lodging, hotels, apartments, banks, improvements in the

transportation system, and the increasing quality of infrastructure (Ehinmowo & Eludoyin, 2010). Based on the service scale, there are three types of trade and service commodity classifications according to Gallion & Eisner (1983) and according to Law No. 7 of 2014 which is divided into primary, secondary, and tertiary commodities.

In the development of commercial activities, it is necessary to know the influencing factors in order to identify the direction of development there are four factors, namely accessibility to the market area and direct access to the highway, the range of existing commercial activities must be adjusted to the type of commercial in order to be able to meet the expected targets, suitable terrain where the development of commercial activities will develop if the business location is in a relatively flat topography, and the availability of facilities and infrastructure (Kaiser, Godschalk, & Chapin 1995). Therefore, the emergence of commercial activities cannot be separated from economic, physical, and environmental factors.

Migration of population is a classic problem that arises in large cities such as what happened in the city of Surakarta. Population migration on a large scale began to occur in Surakarta City, especially Jebres Village every year in addition to migration or urbanization. The migration is in the form of the presence of new students at a university. The quota given by each university is very high for new students, it can even reach thousands of students. In addition, there are several leading universities in the city of Surakarta as a goal to continue higher education levels. The phenomenon of the development of the educational area when it occurs can be shown from the growth of retail businesses which are mostly

carried out by small, medium, and sporadically scattered entrepreneurs which are considered to be potential locations.

One of the educational areas that has a function as a center for educational activities in the city of Surakarta is in the Kentingan Higher Education Area, Jebres Village. Commercial activities appear to dominate with the existence of higher education such as Presence Universitas Sebelas Maret (UNS), Institut Seni Indonesia Surakarta (ISI), and Sekolah Tinggi Ilmu Kesehatan (STIKES) Aisyiyah Surakarta. The existence of an educational area will have an influence on an area, including increasing population and affecting the physical development of the city which gives rise to supporting activities such as commercial activities (Haryanto, Soetomo, & Buchori (2016). These commercial activities are a creative community economy accompanied by technological developments created by the community as well as service businesses related to cellular phones, computers, laundry, restaurants, cafes, hotels, boarding houses, health, beauty, photocopying, and various other small businesses. Commercial activities in the Jalan Kartika area can be seen in Figure 1,



Figure 1. Commercial Activities in the Kartika Road Area

Jalan Kartika Corridor is one of the areas that is experiencing very rapid development in Jebres Village. This corridor experienced a very rapid change in space utilization from the former being a residential building, but over time the change in the function of the space developed quite rapidly. Almost the entire length of the Jalan Kartika corridor has changed its function to become commercial. Basically, any land in the educational area is considered a potential land that can be used as a place to make profits. Not only along the main corridor road, even entering the residential area is not spared from commercial activities. This provides advantages for business actors.

There are several studies related to land change as well as in Kusri et al. (2011) who conducted research by looking at the form of land use from non-built to built in the new growth center of Gunungpati which is close to settlements and universities. The study from Hermaputri & Haryanto (2013), conducted in the Jalan D.I Panjaitan Samarina Corridor by looking at the factors that affect commercial activity in the trade and service area. Meanwhile, Fransinata (2015) conducted research on changes in the function of buildings due to the existence of the Education Area in Tembalang Village. Next, Wardhana (2016) who conducted research to examine the use of space for commercial activities in the Jalan Taman Siswa corridor and to find the causes of land development in the area.

The emergence of commercial activities in a residential area is a natural phenomenon. However, this becomes unreasonable because commercial activities develop in residential areas and cause land which was originally designated residential land to be turned into commercial activities. Based on the descriptions of previous studies, this research should bring up a change in the pattern of land use development and look at the influencing factors in the education area. In the end, the development of commercial activities in the Jalan Kartika area needs to be investigated so that it can be seen how the changes in the use of space in the surrounding areas. This research was also conducted to see how the development of commercial activities in the Jalan Kartika area and to see the factors causing changes in space use both from environmental factors, location factors, and the influence of educational activities as a center of activity.

II. RESEARCH METHODS

The research which analyzes the change in the use of residential space to become commercial in the Jalan Kartika area uses quantitative research methods. This method is a scientific method because it meets scientific principles,

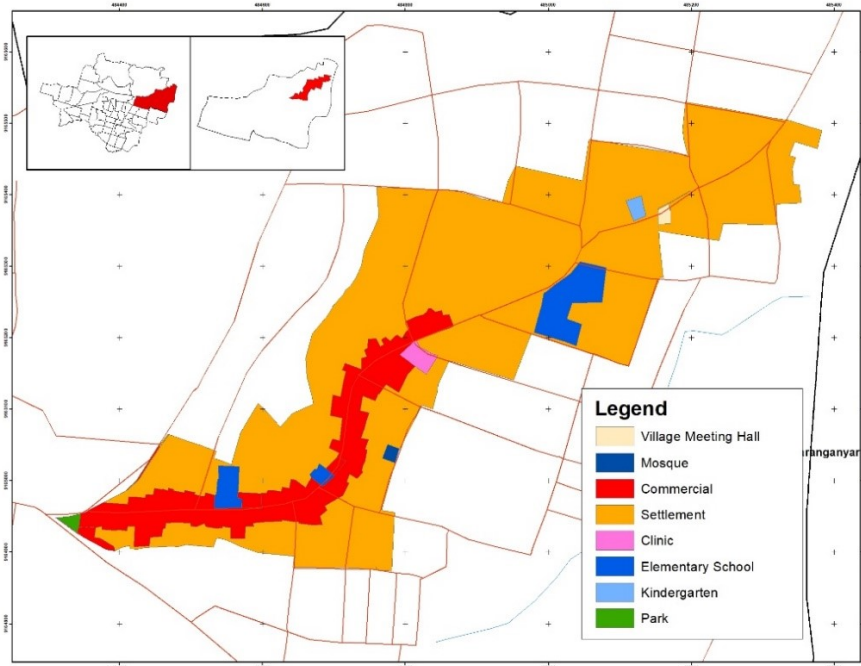
namely concrete/empirical, objective, measurable, rational, and systematic. In this method using research data in the form of numbers and analysis using statistics. The analysis that will be used in this study includes an analysis of the use of commercial activities in the Jalan Kartika area to determine the development of commercial activities in the Jalan Kartika area. This analysis uses data in the form of maps and images to find out how and the direction of the development patterns that occur.

In addition, it also uses data obtained from questionnaires and interviews as the basis for information related to the emergence of existing commercial activities. The second is the analysis of factors that influence commercial development to determine the factors that influence the development of commercial activities in the Jalan Kartika area with the presence of universities and market demand as factors that underlie the development of commercial land use along the road corridor. The data was obtained by using a questionnaire on the respondents, namely the owners or employees of existing commercial activities. The sampling is obtained by using the Slovin formula with a total population of 360 commercial activities. This amount was obtained after conducting a quick survey of commercial activity calculations along the Jalan Kartika area.

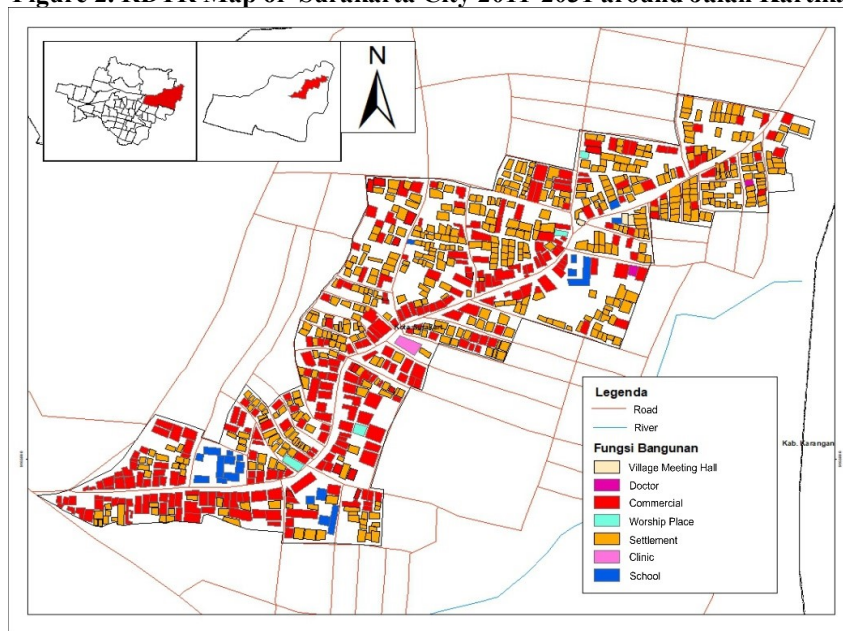
The number of samples obtained is based on the Slovin formula, with a confidence level used to determine the response of 90% and an error tolerance limit of 10% with a population size of 360 attempts so that a sample size of 79 is obtained. The sampling technique that will be used in sampling is purposive sampling, which is intended so that the respondents who become the data source are clear, namely the perpetrators of commercial activities in the Jalan Kartika area and do not collect data from non-commercial activities.

III. RESULTS AND DISCUSSION

Analysis of Space Utilization in the Kartika Road Area. To analyze changes in space utilization factors, it is necessary to identify the existing use of space in the Jalan Kartika area with the comparison of space utilization that has been carried out by the regional government as stated in Surakarta City Spatial Plan Details/Rencana Detail Tata Ruang Kota Surakarta (RDTR). This is done to see whether the existing space utilization is in accordance with the directions or vice versa. Then the RDTR map will be compared with the existing spatial utilization map on Jalan Kartika Area. Map of spatial use in the Kartika area according to the RDTR and the existing map of space utilization in the Kartika area of Jalan Kartika can be seen in Figures 2 and 3,



Source: Surakarta City Spatial Plan Details 2011-2031
 Figure 2. RDTR Map of Surakarta City 2011-2031 around Jalan Kartika



Source: Researcher Analysis, 2018
 Figure 3. Map of Existing Spatial Utilization of Jalan Kartika

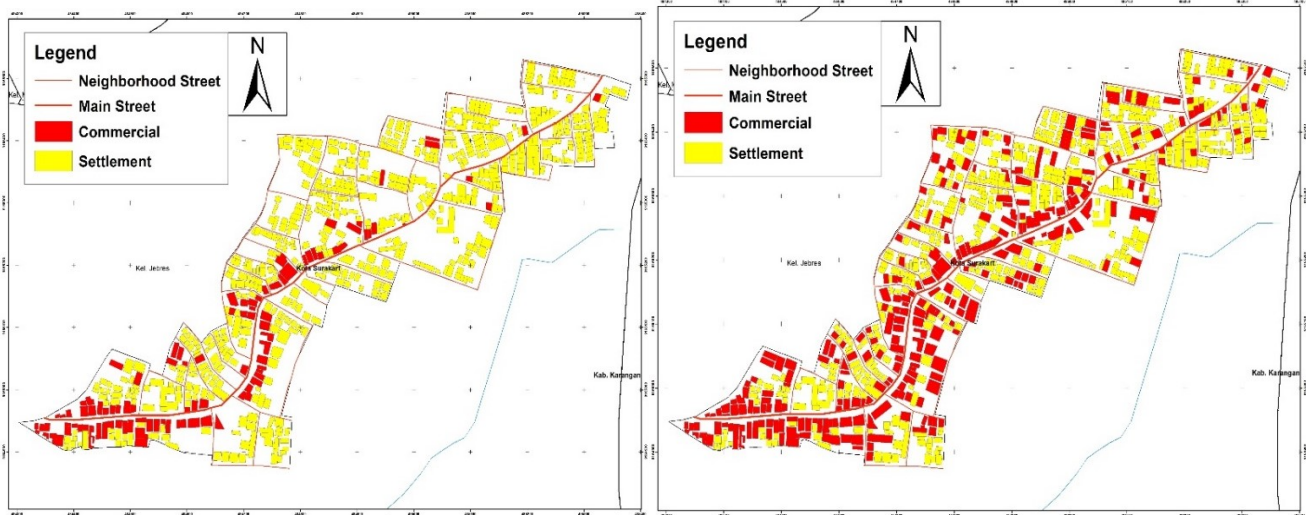
According to the Surakarta City's RDTR in 2013, the Jebres Urban Village area is included in BWK V. BWK V in the Surakarta City Spatial Detail Plan has a directive, namely to function as a center for education services. The existence of 3 universities such as Universitas Sebelas Maret (UNS), Institut Seni Surakarta (ISI), and STIKES Aisyiyah Surakarta in Jebres Village is in accordance with the policies issued by the Surakarta City Government. However, if you look at the plans that have been carried out by the government contained

in the RDTR document for the City of Surakarta, the Jalan Kartika area is mostly planned as a residential area in only a few parts located along Jalan Kartika which are planned as commercial. Over time and the development of the Kentingan educational area, the Jalan Kartika area experienced very rapid commercial development. This is because commercial is intended to meet the needs of overseas students. With the development of the Kartika Road Area, the current use of space is not in accordance with what should be planned. The Jalan Kartika area is starting to be dominated by

the many commercial activities that exist. Commercial activities are also developing to enter residential areas not only along the corridor.

The analysis of the pattern of development of commercial activities aims to determine the distribution pattern of commercial activities in the Jalan Kartika area. The

explanation of this development pattern is based on the development pattern according to (Hartshorn, 1992). The following is a map of the development pattern of the Kartika Road Area which can be seen in Figure 4.



Source: Researcher Analysis, 2018

Figure 4. Commercial Development Patterns in the Kartika Road Area

Based on the picture above, it is known that the pattern of development of commercial activities in the Jalan Kartika area is in the form of a pattern of specialized areas or special areas where commercial activities grow sporadically with certain interrelated commodities and ribbons. The pattern of specialized areas is a pattern of development of economic activities that is not planned but arises because of a common interest. This is different from research (Hermaputri & Haryanto, 2013; Wardhana & Haryanto, 2016) which has a pattern of ribbons development that follows the road/corridor where various commercial activities are spread that depend on the traffic flow in the corridor. Meanwhile, the Jalan Kartika area has integration, namely moving to support the needs of students as actors in activities from higher education in the form of guest houses/boarding houses, restaurants, laundry, and commercial support for other student needs.

Analysis of the Characteristics of Commercial Activities in the Kartika Road Area by Zone Division. This analysis will

discuss the characteristics of commercial activities in the Jalan Kartika area. In this analysis, it is divided into 2 zones based on a predetermined grouping of zones. It is divided into 2 zones, namely zone A and zone B. There are 80 questionnaires as a sample which were distributed to owners/employees of commercial activities to determine the characteristics of commercial activities in the Jalan Kartika area. Based on the results of the analysis of commercial characteristics in the Jalan Kartika area, it is dominated by primary commodities Gallion & Eisner (1983), primary commodity trading activity, is a type of trading that is needed on a daily basis and has a high daily purchase frequency. So that these characteristics are in accordance with the development of primary commodities in the Jalan Kartika area due to the high demand for meeting the daily needs of students and the surrounding community. The results of the analysis of the characteristics of commercial activities in the Jalan Kartika area based on zone grouping can be seen in Table 1 as follows.

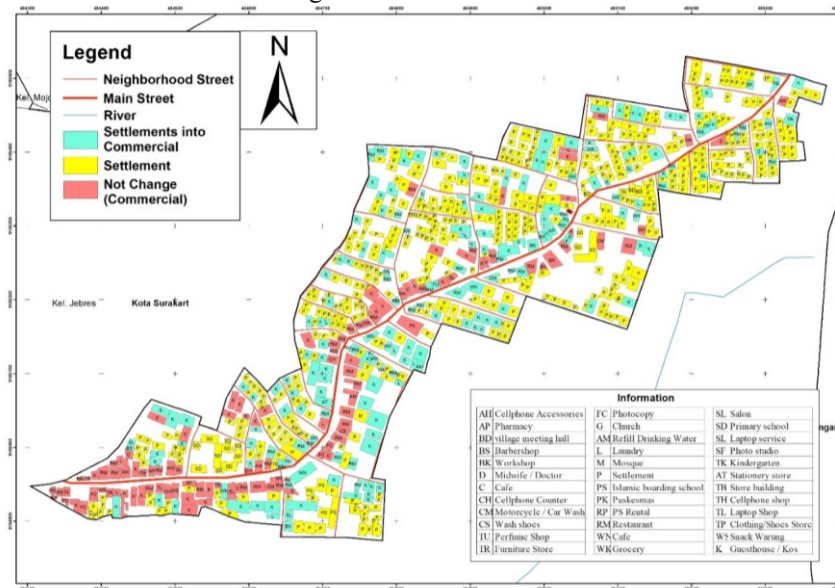
Table 1
 Results of the Analysis of the Characteristics of Commercial Activities in the Kartika Road Area Based on the Grouping of 2 Zones

No	Zone	Commercial Characteristics	Space Utilization
1	Zona A	Commercial activities that dominate in zone A in the Jalan Kartika area are primary commodities and housing services. The dominant ownership of commercial activities is mostly private property with the dominant operating time between 13-17 hours per day. Existing commercial activities have been operating for an average of 6-10 years. In addition, most of the reasons for establishing a business and choosing its location are based on the presence of universities in the surrounding environment.	Most of the commercial buildings in zone A are used for business purposes only.
2	Zone B	Commercial activities that dominate in zone B in the Jalan Kartika area are commercial types of housing services and so are the primary commodities below. The dominant ownership of commercial activities is mostly private ownership.	Most of the commercial buildings in zone B

No	Zone	Commercial Characteristics	Space Utilization
		Meanwhile, the operational time in this zone ranges from 13-17 hours per day. Commercial activities have been operating between 6-10 years ago. In addition, most of the reasons for establishing a business along with the choice of location are also based on the presence and development of universities, as is the case in zone A .	are dominated by mixed functions, namely houses and commercials.

Analysis of Changes in the Use of Residential Space to Commercial in the Jalan Kartika Area. The Jalan Kartika area has experienced the phenomenon of changes in space utilization. Some people who own land in the Jalan Kartika area have changed the function of the building into a

commercial activity which was originally a house. The following is a map of changes in the use of residential space to become commercial in the Jalan Kartika Area 2003 – 2018 in Figure 5.

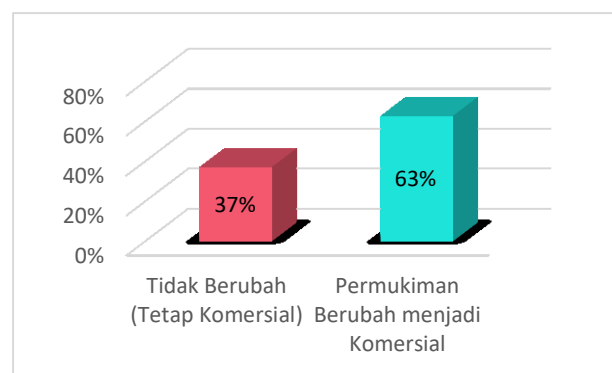


Source: Researcher Analysis, 2018

Figure 5. Map of Changes in Use of Settlement Space Becomes Commercial in the Jalan Kartika area of 2003 - 2018

Based on the map of the above changes, it can be seen how many buildings are changed and unchanged in the Jalan Kartika area. Much changes occur when entering into settlements compared to the road corridor. Commercial activities in the road corridor have occurred a lot before even though it was also a change in settlements. Changes in space for space in the area of Jalan Kartika lead more to the function of the guesthouse / boarding room. The use of settlement spaces turned into a restaurant also happened a lot in the area. This is natural because the Kartika Street area is close to the regional education area. Wisma / boarding is much needed for temporary residential sites for rantau students, while restaurants to meet the needs of students every day. This is in line with the opinion of Verburg & Veldkamp (2004), that the utilization of the surrounding land can trigger changes in land use and the increase in land prices in the future. In a period of approximately 15 years the area of Jalan Kartika has undergone a change in the use of settlement space to be commercial as much as 63%. Based on the phenomenon that occurred in the Jalan Kartika area proving that in this region the changes that occurred quite dominantly compared to unchanged data showing a number of 37% can be seen in (Figure 6). Changes in space utilization in this region are dominated by mixed functions, namely with

dwelling and commercial functions. In addition, changes that occur most commercial activities that exist are running without an official business permit or IMB. IMB which is still put in place is with a residential function or even nothing at all.



Source: Researcher Analysis, 2018

Figure 6. Graph of Percentage Change in Use of Residential Space to Commercial in the Jalan Kartika Area 2003 – 2018

Analysis of Factors Influencing the change in the use of residential space to become commercial in the Jalan Kartika area. The first analysis used descriptive statistics to see how

the influence of each variable. After that, use factor analysis to find out the variables that are formed and correlated with each other into one factor of variation in the existing data. To

see the effect of each variable has been determined using descriptive analysis and can be seen in Table 2 below:

Table 2.

Average Score Value of Each Variable

Variables	Mean	Influence Level	Information
Number of Students	4,88	Influential	This variable has the highest influence because the number of students in the Jalan Kartika area is an opportunity for the community to open a business
Campus Presence	4,50	Influential	Has sufficient influence because the existence of the campus triggers the development of commercial activities
The existence of boarding houses	4,15	Influential	Has a high influence because the existence of the boarding house becomes a temporary residence for students and students as the main target of commercial in the Jalan Kartika area
Strategic location	4,26	Influential	Has a high influence because the business location factor greatly affects the business affecting the number of consumers
Location Security	3,30	Quite Influential	Quite influential because most commercials require security in every business
Support Facilities and Infrastructure	3,69	Quite Influential	It is quite influential because most of the existing commercial facilities require good service facilities and infrastructure
Existence of Similar Business	2,96	Less Influential	Less influence because if there are too many similar businesses, it will increase business competition
Ease of Reaching Location	2,41	Less Influential	Not so influential because the people of the Jalan Kartika area don't pay much attention to it
Traffic Condition	1,88	Less Influential	Not so influential because Jalan Kartika is not a busy main road
Rental price	3,75	Quite Influential	Quite Influential because the price for renting space determines someone in opening a business
Land Price	3,78	Quite Influential	Influential enough because the price of land for space determines someone in opening a business

Looking at the table above, in looking at the average score or mean of the influencing variables, it can be classified into three groups. This grouping is done by grouping variables that have almost the same average value into one with the assumption that the effect of these variables on changes in the use of residential space to become commercial in the Jalan Kartika area is the same. The grouping of these variables is Group 1 which includes the influential variables consisting of the number of students, the existence of a campus, the existence of boarding houses, and strategic locations. Group

2 which is quite influential consists of the variables of location security, support for facilities and infrastructure, rental prices, and land prices. Group 3 which is considered less influential consists of the variables of ease of reaching the location, traffic conditions and the existence of similar businesses.

In the factor analysis that has been carried out to see the formed variables and correlated variables, it can be seen in Table 3 below:

Table 3

Naming the Variables Formed

Parameter Codes	Parameter Value				Naming the Variables Formed
	Variable 1	Variable 2	Variable 3	Variable 4	
VKP_2	0,074	0,791	0,251	0,236	Variable of Higher Education Existence
VKP_1	0,281	0,752	-0,299	0,004	
VKP_3	-0,433	0,734	-0,123	0,056	
VE_2	0,902	0,144	-0,005	0,048	Economic Variable
VE_1	0,897	0,094	0,125	-0,094	
VLo_1	-0,011	0,098	0,825	-0,062	Location Variable
VLo_3	0,313	0,497	0,550	0,032	

VLo_4	0,355	0,365	0,574	-0,019	
VLo_2	-0,205	0,304	0,682	0,174	
VA_2	0,064	0,027	-0,085	0,880	Accessibility
VA_1	-0,199	0,053	0,228	0,676	Variable

Notes:

- | | |
|-------------------------------------|--|
| 1. VE_2 : Land Price | 7. VLo_3 : Facilities and Infrastructure Support |
| 2. VE_1 : Rent Price | 8. VLo_4 : Existence of Similar Business |
| 3. VKP_2 : University Existence | 9. VLo_2 : Location Security |
| 4. VKP_1 : Number of students | 10. VA_2 : Traffic Condition |
| 5. VKP_3 : Boarding house existence | 11. VA_1 : Ease of Reaching Location |
| 6. VLo_1 : Strategic Location | |

Based on the results of factor analysis, it can be seen that the factors that influence the change in the use of residential space into commercial activities in the Jalan Kartika area consist of 4 variables. Each parameter that makes up the variable has a constructor greater than 0.5, which indicates that each of these parameters is feasible to form a variable. There are 4 variables formed, namely the Presence of Higher Education (variable number of students, campus existence variable and the existence of boarding houses or guesthouses), Location factor (strategic location variable, location security variable, facility and infrastructure support variable and the existence of similar businesses), Accessibility factor (easy to reach location and traffic condition variable, Economic factor (land price and rental price).

The results of the factor analysis above are in accordance with the research conducted by regarding the factors that influence the use of space in the education area that the existence of universities as growth centers has a strong influence on the surrounding area. One of the visible phenomena of the Jalan Kartika area is the large number of changes in space use that trigger the growth of commercial activities of shops/shops, and mixed functions (residential and commercial) such as boarding houses, resulting in increased population density in an area (Prasetyo Samadikun et al., 2014).

If it is associated with the location factor of Von Thunen (1826), the key to location theory is the distance from the location to the market center (city center and activity center). This is in accordance with the location theory of Von Thunen (1826) which explains in substance the strategic location when viewed from the proximity to the city center and the center of population activity in the Jalan Kartika Area such as being close to the Kentingan Education Area, close to residential areas, and close to public facilities. complete. Furthermore, the accessibility factor is in line with the theory of Von Thünen (1966), where the ease of movement between locations can affect land prices. The location of the land with activity space as a residence, commercial, and other supporting facilities is supported by easy accessibility so that this ease of access has implications for increasing land prices in the Jalan Kartika area.

In addition, according to Kaiser et al., (1995) factors that can influence the development of commercial activities are economic factors, in this context land is determined by the land market in an area, thus affecting the development of commercial activities in the Jalan Kartika area. It is shown that some respondents have a perception that land prices have increased, reaching 8 million/m²-15 million/m² due to the growing development of commercial activities to support student needs. Likewise, the rental price for land in the Jalan Kartika area is between 15 million – 50 million per year. The existence of several campuses in the Jalan Kartika area affects the price or rent of the surrounding land. This is due to the high demand for student needs such as a place to stay while studying or to support other needs, resulting in the land around the Jalan Kartika area being used for commercial activities. Although respondents on average stated that the rental price was not cheap, respondents in the Jalan Kartika area were still able to reach the rental price. The price of land along the corridor and in the Jalan Kartika area will continue to rise every year so that there will be many changes in the function of the building because the land owner will sell or rent a place of business to take advantage of the opportunity. Therefore, this will affect the increase in the value of land in the Jalan Kartika area and its surroundings, especially land that has a strategic location and the high and low prices or land rents in the Jalan Kartika area will affect the commercial activities in it.

IV. CONCLUSION

There are differences that occur in the current use of the space in the Kartika Road area with the use of space that has been planned by the government. The discrepancy in the use of space that occurs is not only along the corridor as in the general case, but the discrepancy also occurs until it enters the settlement and is dominated by commercial activities in the form of housing services and primary commodities. The pattern of development in the Jalan Kartika area is in the form of a pattern of specialized areas or special areas where commercial activities with certain commodities are interrelated. The pattern of specialized areas is a pattern of development of economic activities that is not planned but arises because of a common interest. The Jalan Kartika area has integration, namely moving to support student needs.

Zone A is mostly used as a place of business and is dominated by primary commodities and housing services. The development in the development zone is experienced faster

because it is located directly adjacent to the campus. Meanwhile, in zone B, most of the commercial buildings are used as a mixed function, namely residential and commercial and are dominated by commercial types of housing services

The Jalan Kartika area has experienced a change in the use of residential space into commercial as much as 63%, while those that have not experienced a change are 37%. Wisma/Kos are commercial activities that mostly change residential areas into commercial ones in the Jalan Kartika area. Likewise with restaurants, because basically most of the commercial activities in the Jalan Kartika area are mainly students.

Factor analysis. If you look at the level of influence, it is divided into 3 groups, namely Group 1 which includes the influence of variables, the number of students, the existence of a campus, the existence of a boarding house, and. group 2 which is quite influential consists of the variables of location security, support for facilities and infrastructure, rental prices, and land prices. Group 3 which is considered less influential consists of the variables of ease of reaching the location, traffic conditions and the existence of similar businesses. Meanwhile, if grouping based on correlations between variables in the sense that it is based on the ability of these variables to explain relatively the same data variations, 4 factors are formed, namely the presence of higher education (variable number of students, variable of campus existence and variable of existence of boarding houses or guesthouses), location factor (strategic location variable, location security variable, facility and infrastructure support variable and the existence of similar businesses), accessibility factor (easy to reach location variable and traffic condition variable, economic factor (land price and rental price).

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The Concept of Islamic Entrepreneurship in Forming Influential Personality: A Personal Analysis of the Prophet SAW

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Abstract

Entrepreneurship is one of the branches of career in earning a living. An entrepreneur has to go through a certain process through his business activities where this career requires a very high level of commitment. The history of Rasulullah SAW's involvement in business began when he started managing the business of his uncle, Abu Talib. He then served to manage Saidatina Siti Khadijah's business. The trust given to the Prophet in both of these situations is closely related to the influence he has on the personality of the Prophet SAW who is known as a person of noble character and trust (al-amin). So this study aims to see to what extent the personality is able to influence the next customer to develop a business based on a positive personality and the influence of the Prophet SAW as a businessman with noble morals. Therefore, a literature review was conducted to analyze the personal characteristics of Rasulullah saw as a businessman by examining the morals and influence of the Prophet saw while managing a business. Nevertheless, the personal comparisons of entrepreneurship outlined by David McClelland were also studied to examine the ability of western scholars in determining the personality of entrepreneurial influence. The results of this study found that the influence of Rasulullah's personal moral personality can attract buyers to buy the goods he traded, so that a famous businessman Saidatina Siti Khadijah chose Baginda to be his business partner as a success strategy in his business. So the personality of the businessman gives a great influence to attract customers and develop the business globally. The progress of a business has to do with the personalities of a business leader who is trustworthy, honest, disciplined, tolerant, courageous, does not give up, works hard, is modest, confident, communicates well and wisely manages business finances.

Keywords

Characteristics of Influential Entrepreneurs, Morals of Rasulullah Saw in Business, Business Success

I. INTRODUCTION

The concept of Islamic entrepreneurship is still a topic of discussion in Islamic studies today. In every worldwide industry, the country's training and financial institutions play a role in supporting the growth of new entrepreneurs, but the country's entrepreneurship successes have not yet achieved a satisfactory level. As a result, research into the elements that contribute to entrepreneurship's success and failure should be prioritised, because these discoveries will enable entrepreneurs to take the initiative and provide direction in running company in a more structured and managed manner. As a result, referring to the comparative analysis of Rasulullah's entrepreneurial characteristics and the characteristics of a successful entrepreneur, as well as entrepreneur personality traits, can assist entrepreneurs in

recognising the personal characteristics of a successful entrepreneur in business.

As a result, before deciding to pursue entrepreneurship as a career, an entrepreneur must understand the fundamentals of the word entrepreneur. The word 'entrepreneur' comes from the French word 'entreprendre,' which means to shoulder or try. Meanwhile, according to Kamus Dewan Bahasa Malaysia,¹ the term entrepreneur is derived from the word 'effort,' with the term effort referring to the ability to perform or complete a job, which includes efforts, activities, actions, and other factors.

However, if an entrepreneur understands the true meaning of the term, the term entrepreneur has made it clear that the entrepreneur must be successful. According to Muslim

¹ Kamus Dewan Bahasa dan Pustaka, ed ke-4, (Kuala Lumpur: Dewan Bahasa dan Pustaka, 2015).

Kelana², in order to be a successful entrepreneur in this world and in the afterlife, one must follow the Islamic law's guidelines. It is clear that every entrepreneur must perform well in their respective businesses in order to facilitate daily operations. As history shows, a man put business as a career by simply believing in the practise of goodness 15 centuries ago. As a result of his trustworthiness, fathonah, tabligh, and honesty, he was given the name al-amin. The community has been enthralled by whatever is being traded without even realising it until its business has prospered.

Therefore, an entrepreneur's personality traits must place Rasulullah's entrepreneurial characteristics as the main standard in shaping the Islamic entrepreneurship model. This is because, according to Noraihan,³ one of the factors of loyal and strong customers is entrepreneurial personality. Thus, the tabiin and scholars frequently extol the Prophet SAW's personal beauty as an entrepreneur who manages a business at a young age. By enriching the nature of honesty, firmness in keeping promises, and other noble qualities, personality becomes a priority in His Majesty's business affairs.⁴ Customers are drawn to entrepreneurs because of their noble personalities. As a result, it is clear that an entrepreneur's entrepreneurial personality is critical to his or her success. The existence of an entrepreneur's good nature has opened the door for capital owners in Mecca to run a business partnership with Muhammad bin Abdullah that includes wages (fee based) and profit sharing (profit sharing). It can be seen here that the Prophet SAW's attitude and behaviour has instilled trust and confidence in the ignorant community to learn the Prophet SAW's business techniques. When this information reached Khadijah, a female entrepreneur, she offered a revenue distribution (mudharabah) partnership in which she would be the financier (Shahibul mall) and Muhammad B Abdullah would be the fund manager (Mudharib). Khadhijah's business has expanded to include Yemen, Syria, Basrah, Iraq, Jordan, Bahrain, and other trading cities in the Arabian Peninsula as a result of the trust and influence he possesses. Thus, the entrepreneurial characteristics of Rasulullah saw have proven their effectiveness, as many of Rasulullah saw's companions, such as Abdul Rahman B Auf and Abu Bakar As sidik, have achieved success in business by following in the footsteps of the Prophet SAW's business. Finally, with this wealth, Islam can spread across the globe.

As a result of his business partnerships, Muhammad b Abdullah became known as the "Mover of the Islamic Economy." Clearly, he is a firm, consistent, and systematic person in business, so that any problem in business affairs can be resolved quickly, and he makes the best use of every opportunity. So, after 15 centuries of history, this knowledge of entrepreneurship has become a model for western researchers, resulting in the knowledge of entrepreneurship being found in many western best-selling books such as Rich

dad poor dad (Robert kyosaki 2000), The power (Antony Robert 2004) and many others, each of which explains the things that entrepreneurs must follow if they want to succeed. More interestingly, the results of the bookkeeping and seminars conducted have produced many millionaires around the world.

However, the reality of the Muslim community is now more inclined to study western books and know more about western millionaires than Muslim millionaires. This is because the non-Muslim community's results of business success are more encouraging than the Muslim community's. The importance of western-published books is greater than that of Muslim-published books. Peter Drucker (1985)⁵ and Joel Arthur Backer (2003, among other western scholars, argue that successful entrepreneurs must be able to mobilise economic resources to productive sectors in a consistent and systematic manner, and even successfully create added value and opportunities in market competition now.

Thus, an analysis that looks at the relationship between the characteristics of entrepreneurship of Rasulullah saw with the characteristics of successful entrepreneurs, can be compared with the personality traits of entrepreneurs that have been outlined by psychologists

Summary of comparative analysis of entrepreneurial characteristics with entrepreneurial personality traits.⁶

No	The characteristics of entrepreneurship of the Prophet saw	Personality characteristics, successful entrepreneur (David McClelland 1985 and Mc Ber & Co)	The personality traits of the entrepreneur	Analysis of entrepreneurial researchers in Malaysia
1	Never hurt the hearts of other traders.		Way of thinking	Positive thinking (ahmad zaki 2011)
2	Straight and accurate with the count	1-Convince others	Perception	Determining the limits of good and bad (buerah Tunggak 2011)
3	Always smile when buying and selling	2-Perseverance 3-energetic	Attitude	Attitude has a relationship between 3 components that are closely related, namely,

² Muslim Kelana, Menjadi Usahawan Sehebat Muhammad bin Abdullah, (Petaling Jaya: Leeds Publication, 2008).

³ Mohamd Noraihan, Pengaruh Jalinan Kekayaan Media dan Personaliti Usahawan terhadap Kepercayaan Pelanggan dalam Membentuk Kesetiaan kepada Premis Perniagaan, *Tesis Kedoktoran*, Universiti Utara Malaysia (2018).

⁴ Hepi Andi Bastoni, Beginilah Rasulullah Berbisnes (Kuala Lumpur: Jundi Resources, 2013)

⁵ Peter F. Drucker, *Innovation and Entrepreneurship*, Hupper & Row, 1985.

⁶ Tengku Maaidah Bt Tengku A Razak 2018. Keberkesanan Program Latihan Usahawan Mikro Dalam Membantu Usahawan Bumiputra Islam. ISSN: 2337-6821.vol.12.no 12. Agustus 2016 M. Jurnal Reflektika.

				perception, values and behavior (nor Aishah Buang 2013)
4	Honest and responsible	4-Find information 5-Have an influential strategy 6-Purposeful and visionary	Value	Values that are liked and enjoyed by the community (Nor Aishah throw 2013)
5	Gentle when doing business	7-Systematic planning	Phobia	Culture is part of Islam, not religion is part of culture (Buerah Tunggak 2011)
6	Do business creatively	8-Oriented towards tenacity 9-See and seize opportunities 10-high workmanship	intelligence	High level of ability and ability (shuhairimi Abdullah 2010)
7	Not a mere pursuit of wealth	11-Commitment to work	Motivation	Don't give up (Ahmad Zaki 2011)
8	Fluent in speaking words		ability	Entrepreneurs need to improve their knowledge and skills from time to time (syed zamberi 2009)
9	Make wise decisions	12-Creatively solve problems 13-self-confidence 14-assertiveness 15-initiative	Way of thinking	Nothing is impossible (Ahmad Zaki 2011)

II. Why does Rasulullah's personality have an Influential personality?

Through a comparative analysis of entrepreneurial characteristics, the findings of this study show that Rasulullah's entrepreneurial characteristics emphasise the formation of personality as the foundation in an entrepreneur, and that an entrepreneur must prepare by improving personality before starting a business. Identity, according to psychologists, can differentiate an entrepreneur from a non-entrepreneur. The nature of an entrepreneur is one of those associated with identity. However, western psychology explains that the nature of a successful entrepreneur is to have initiative, be good at business planning, and so on, but the Prophet's personal nature has proven the characteristics of entrepreneurship for him to be honest and trustworthy. In the narration of the Prophet saw said:

“A man told Rasulullah saw that he was deceived in buying and selling. So his words mean "When you trade, then say, there can be no deception”

(al-Bukhari)

It is clear here that Rasulullah saw forbade if traders are dishonest and trustworthy in their business, among these qualities is that he is highly respected and trusted by the capitalists in Arabia.

However, the personality outlined by MacClean also emphasizes attitudes, perceptions, values and motivations as well as others have to do with the entrepreneurial characteristics of Rasulullah saw, where he emphasized a lot of personality and morals as an entrepreneur.

According to Nor Aishah Buang,⁷ the existence of a good attitude is a component in shaping one's perceptions, values and behavior.

III. Never hurt the hearts of other traders

Rasulullah saw never hurt other people's hearts, in fact everyone who dealt with him all felt happy and satisfied, the nature of Rasulullah saw who was humble and did not exalt himself caused other traders never to feel sorry for Rasulullah saw's attitude, this is because he was always positive in the way of thinking. Allah swt's words mean:

“O you who have believed, do not consume one another's wealth unjustly but only [in lawful] business by mutual consent”. (al-Nisa', 4:29)

The words of Rasulullah saw mean:

From Salim RA from his father, he said that Rasulullah saw said: “A Muslim is a brother to fellow Muslims. He must not persecute his brother and he must not allow his brother (to be persecuted). Whoever helps (suffices) the needs of his brother, then Allah swt helps him (suffices) his needs. Whoever relieves the difficulties of a Muslim, then Allah swt relieves his difficulties on the Day of Judgment. And whoever covers up the mistakes (secrets) of Muslims, then Allah swt will also cover his mistakes on the Day of Judgment”(Muslim)

⁷ Nor Aisyah Buang, Managing Quality Entrepreneurship course for community college student in Malaysia, *International Business Management*, V. 5, 255-265, 2011.

IV. Straight and accurate with the count Always smile when buying and selling

Public perception is very important in doing business. If there is a negative perception from customers, it can cause our business to be distrusted by the community. Therefore, it is important for an entrepreneur to know the consequences of taking lightly regarding the accuracy of the weighing of goods. The words of Allah swt which means:

“Woe to those who give less [than due], Who, when they take a measure from people, take in full. But if they give by measure or by weight to them, they cause loss. Do they not think that they will be resurrected. For a tremendous Day. The Day when mankind will stand before the Lord of the worlds?. No! Indeed, the record of the wicked is in Sijjeen”.

(Al-Mutaffifin 1-7)

The words of the Prophet saw

“What is the best search? he replied: the person who works with his hands and every transaction is clean”(al-bazzar)

V. Always smile when buying and selling

Every customer has different emotions, but sellers also still have their own emotions. In a sale and purchase transaction, of course the noble nature must be exhibited by the seller, because the buyer always evaluates the behavior and attitude of the seller towards his presence. Clearly here in transactions, we need to be patient and responsible in providing the best possible service to customers. The character of the Prophet is very perfect: his figure is attractive and handsome, always carries a smile on his face, always greets everyone he meets, friendly and easy-going, speaks the language neatly arranged and uses the appropriate language barrel, very honest and easy to negotiate. This is the perfect package that needs to be owned by a salesperson and entrepreneur as owned by Rasulullah.

VI. Honest and responsible

In running a business, the nature of honesty and trust is something that can give trust to the business, because the customer always evaluates and observes every transaction that is carried out, even those qualities can reward the world and the hereafter. Allah swt said:

“O ye who believe! fulfil the compacts”(al-Ma'idah, 5:1)

“Indeed, Allah commands you to render trusts to whom they are due and when you judge between people to judge with justice”. (al-Nisa', 4:58)

Rasulullah saw said, meaning:

"Whoever is honest and trustworthy, will be with me"

The high integrity of the operator engenders customer trust in the quality of services and products offered. Customers are confident in the ability of entrepreneurs and sellers to meet their needs. It also binds the hearts and interests of customers to continue doing business with the dealer.

Mohd Adib et.al⁸ explained that entrepreneurs who have the nature of trust and honesty will always be aware that the business venture he conducts is a trust from God. He is duly responsible for the trust.

VII. Gentle when doing business

Psychology in business is very important to attract customers to deal with sellers. It is natural for human beings to want friendly service, easy to negotiate and have an identity that customers can trust. It even becomes an added value and privilege if the seller has an attractive face. So the nature of the gentle valley of Rasulullah saw has caused every sale to sell and bring huge profits. Rasulullah has said which means:

"Allah SWT showers blessings on people who do good when they sell, when they buy and when they make demands."

VIII. Do business creatively

As an entrepreneur, need to add knowledge and customers, then each customer needs to plan and research the capabilities of buyers creatively. Producing a new product needs to plan and research the needs of the customer and know the advantages and disadvantages of the product it produces. The Word of Allah SWT means:

“O believers! Do not violate Allah’s rituals ‘of pilgrimage’, the sacred months, the sacrificial animals, the ‘offerings decorated with’ garlands, nor those ‘pilgrims’ on their way to the Sacred House seeking their Lord’s bounty and pleasure. When pilgrimage has ended, you are allowed to hunt. Do not let the hatred of a people who once barred you from the Sacred Mosque provoke you to transgress. Cooperate with one another in goodness and righteousness, and do not cooperate in sin and transgression. And be mindful of Allah. Surely Allah is severe in punishment”. (Al Ma'idah, 5:2)

An entrepreneur needs to be creative and constantly make improvements and innovations to attract customers. Mohd Faizal et.al,⁹ explained that an entrepreneur must always seek innovation, response to the innovation and exploit it to become an opportunity to generate business.

IX. Not a mere pursuit of wealth

Business has always been associated with profit, although this business is a similar career to earn a halal livelihood to meet the necessities of life, but there are still others in our society who compare earning a living with doing business. So it is important for the public to know that the difference between this career is ideology and work movement only, but from the point of view of earning a living it is the same.

⁸ Mohd Adib, A. M., Muhammad Fakhirin, C. M., & Shuhairimi, A. (2014). Pengurusan keusahawanan sosial Islam: Model usahawan berjaya dalam amalan nilai-nilai murni. Kertas Kerja Seminar Penyelidikan Kebangsaan 2014: 386-399.

⁹ Mohd Faizal, P. R., Muhammad Ridhwan, A. A., & Kalsom, A. W. (2013). The entrepreneurs characteristic from al-Quran and al-Hadis. International Journal of Trade, Economics and Finance 4(4): 191-196

Therefore, the nature of Rasulullah saw in the sense of not seeking worldly wealth means that Rasulullah saw never abandoned the duties and orders of Allah swt, in managing business. This trait needs to exist in an entrepreneur who runs a business. Leaving religious obligations such as the five daily prayers and violating all the commands of Allah swt on the assumption that it prevents business activities is completely wrong and should be avoided. Allah swt says: "They 'only' know the worldly affairs of this life, but are 'totally' oblivious to the Hereafter". (al-rum, 30:7)

X. Fluent in speaking words

In a business situation, an entrepreneur needs to explain the services or products offered clearly and convincingly. The seller's confidence in the products and services offered to the customer and the courage in explaining helped him to be fluent in speaking. The seller's fluency in speaking is an attraction to customers, because customers often need product information and evaluate the readiness of entrepreneurs in running a business. So Rasulullah saw often examined the products traded before he introduced them to customers. Allah swt's words mean:

"O you who have believed, fear Allah and speak words of appropriate justice". (al-Ahzab, 33:70)

The eloquence of the Prophet SAW has been explained in a hadith narrated by Saidatina Aishah which means: "It is the Messenger of Allah who speaks with words that are clear and clear and firm, can be understood by everyone who hears it (sitting with the Prophet).

Al-Tarmizi

An entrepreneur also needs to be honest in conveying information of his products and services to customers. Honesty in delivering will make a seller confident and not plagued with guilt. This situation will give strength to the seller and encourage him to deliver boldly, confidently and fluently in speech he said.

XI. Make wise decisions

As an entrepreneur it is necessary to have proper and complete knowledge in their business, where the entrepreneur should be wise in making decisions on his transactions. Even entrepreneurs need to know, the pros and cons in making a decision, as it involves one's thinking style and lifestyle.

Conclusion

The Quran and hadith contain many verses and narrations that explain the nature and characteristics of being an entrepreneur in business. So the verses of the Qur'an that were revealed to Rasulullah saw are a guide and a warning that needs to be conveyed to this last Ummah. Therefore, the personal nature of Rasulullah SAW before becoming a Rasul has the characteristics of entrepreneurship that needs to be practiced because everything that the Prophet Muhammad saw did is mentioned in the Al-Quran. Therefore, the nature and characteristics of Rasulullah saw's business should be used as a model in shaping the personality of an entrepreneur, because it is proven by the personal nature of Muhammad b

Abdullah has made the economic level of Madinah developed and expanded to the entire Arabian Peninsula. In fact, the companions who practiced what the Prophet had done in managing his business, were successful in their business. Thus, the results of this study found that there are clear differences in the determination of the scope and characteristics of entrepreneurship between Islam and the west. In the Islamic context the process to become a successful Entrepreneur, must be applied first business boundaries, which involves the nature and personality of an entrepreneur, then newly applied business management process, but in the western context it emphasizes the process of becoming a successful entrepreneur next to business management.

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A comparative study of Software Development Waterfall, Spiral and Agile Methodology

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Abstract

Software development methodologies are used for developing the simple to complex project. It gives the idea of how systematically projects are developed. It plays important role in software development in academics to industries. It helps to reduce the chances of project failure. The major development technics like waterfall, spiral and agile methodologies, their processes and comparisons shows that, how efficient development occur. The article used to present the study of these three software development methodologies. The main contribution to this work in study and comparing the methodologies. This study helps the software development in academics and industries to understand and comparison to choose the method according to the application.

Keywords

Waterfall, Spiral, Agile and Scrum.

I. INTRODUCTION

The software development methodologies play a very important role in developing the project. Any small to complex software development require systematic flow from requirement to maintenance. It helps the group to develop the project in collaboration. There are many development methodologies, every method having pros and cons. some are traditional development and rest are evolutionary type. Every development technique is useful, but choosing the best technique is important considering the application. The selection is very important in terms of systematic development. If the application is very small and to be developed in weeks then the proper methodology is required, otherwise it will make a negative impact on development process, time and deadline skip. The unplanned or without the use of standard methodologies will make major chances of project failure. It can be observed in terms of satisfaction of customers. The chances that, customer may argue at the time of delivery of project about the quality and scope deviation. To avoid this, choosing of right methodologies will increase the chances of customer satisfaction.

II. DIFFERENT SOFTWARE DEVELOPMENT TECHNIQUES

2.1 Waterfall Model

It was used for decades by the industries and academics. It is still used for small applications where the large changes are not expected. It is simple and follows the sequential development. The next stage will start only when the previous stage is complete. The stages are dependent on the completion of earlier stages. It follows the approach of requirement, design, development and maintenance. Paper proposes many efforts in this regard lead to various proposals of smooth integration of SE (software engineering) processes with HCI (human computer integration) for product development [10]. This paper discusses two main software engineering methodologies to system development, the waterfall model and the object oriented approach, appropriateness of each approach in relation to the complexity of the problem domain [16].

2.2 Spiral Model

It handles the risk in development phases. In spiral the number of loop depends upon the project. In the first quadrant the requirements are collected from the customer and possible solutions are found. In the second quadrant the risks associated with solution found and resolved. In the third quadrant the solution is developed and tested. In fourth

quadrant developed version is checked by customer and planning for the next iteration will start.

Spiral model and its application are used in various scenarios such as website development, mobile application development and traffic management system [1]. The objective of this paper is making a comparison between spiral process and scrum methodologies to show their features and defects. Also examine the circumstances of using either spiral process model or scrum methodology while developing software project [11]. In this paper we are going to take different models for the development of mobile applications cannot be included in the basic phases of SDLC but also focusing on the other factors including cross platform development, memory usage, way of interaction with user and the model is proposed for the Mobile Application Development Life Cycle [12].

2.3 Agile Methodology

It is an iterative development. It divides the task into smaller tasks. Each iteration takes one to four weeks. Each phase includes the requirement, design, implementation testing and feedback. This model is used for quick development. Agile model basically to accept the any changes at any stage and implemented in the next iteration. The expected output is delivered at each iteration in incremental way.

The proposed method includes the best practices from change management, methodology adaptation [8]. Paper includes different approaches of agile. Agile software development; Extreme Programming; Scrum; Feature Driven Development; limitation; agile manifesto[5]. Paper describes to identify various challenging factors that restrict Agile and User Centred Design Integration (AUCDI) and explore the proposed practices to deal with them [13]. Agile process is an iterative approach in which customer satisfaction is at highest priority as the customer has direct involvement in evaluating the software [9]. Academics projects are facing the problem of controlling and monitoring small projects and there is need to improve the project development in academics. On the basis of a case study using SCRUM method presented [18]. Research direction aimed at formalizing a software development methodology dedicated to innovation orientated IT projects is enunciated.[14]. How to choose the appropriate software development methodology. All the essential points and details about the software development methodologies are reviewed in this paper as well as the advantages and disadvantages of each model [2]. This study finds the widely accepted (JCM) Job Characteristic Model for job design relevant in providing a theoretical foundation for the a theoretical domain of SDMs [19]. Current programming advancement strategies are displayed. Improvement stages are characterized for each displayed philosophy. The experienced team and project, manager together gives a best methodology [6]. In this paper focusing on two popular development processes, Rational Unified Process (RUP) and Agile Process, with their several methodologies and implementation and uses sociometric and motivation research methods [15]. The basic motive of this paper is to enact the variety of models and make a relative study of them to show the attributes & shortcomings of each model [3]. Choosing an appropriate management structure can make a

big difference in achieving a successful end result when measured in terms of cost, meeting deadlines, client happiness, robustness of software, or minimizing expenditures on failed projects [17]. Analyze the model & some of the improved software development models and their applications according to certain application fields are introduced briefly [4]. This study proposes a model for the spiral development process with the use of a simulator (Symphony.NET), which helps the project manager in determining how to increase the productivity of a software firm with the use of minimum resources (expert team members)[7].

By studying these software development methodologies, the methods to use according to the application development. As per the customer requirement and his satisfaction the agile method will be better, but the increase in workload may decrease the efficiency of developing team. New approaches to satisfy all stakeholder should be developed which can give better documentation and conducive environment for development. The more focus on quality, finite estimation of project time and cost is required. Some changes are required in existing development methodologies.

III. COMPARISON

S N	Points	Waterfall	Spiral	Agile
1	Method	sequential method.	evolutionary method.	incremental & Iterative
2	Customer	Easy to understand	Tough to understand	Easy
3	used for Type of project	Small	Large	Large
4	Risk identification	Later stage	Earlier stage	Every stage
5	Flexibility	Difficult to adopt changes	Easy to change requirement	Changes accepted at any stage
6	Risk of use	Higher	Lower	Lower
7	Simplicity	Simple	Complex	Easy
8	Customer involvement	Less	less	More
9	Deadlines	Large	large	Short
10	Clarity in requirement	Beginning	Beginning	Requirement Dynamic
11	Cost	Fixed	May change with process	Flexible
12	Task	Phases	Iterations	Sprints
13	Focus	Project delivery	Project delivery	Customer satisfaction
14	Testing	After development stage	In each iteration	In each iteration
15	dependency	Project manager	Project manager	Scrum Master
16	Team Size	Large	Medium	small
17	Documentation	More	More	Less

IV. CONCLUSION

the paper describes different software development methodologies. the waterfall method is suitable for small projects and states the use in human computer interface with complex problem domain. spiral model reduces the risk and states the use in web and mobile application domain efficiently. agile model for faster development will be used. it also find useful in change management, customer satisfaction and used for academic project development. as per study of these three software development methodologies, the use will find according the selection & complexity of project, to increase successful software development in different domains and sectors. with the change in frequent needs of customer, we can consider the agile model can be better to handle.

ACKNOWLEDGMENT

i am to thankful vishwakarma institute of information technology, pune, Army institute of Technology, Pune & Smt. Kashibai Navale College of Engineering, Pune for encouraging towards Research Paper writing.

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The Implications of Pornography Addiction among Adolescents

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Abstract

There has been an uncontrolled increase in the use of the internet among adolescents which many are involved in pornographic activities since the implementation of the Covid 19 Pandemic Movement Control Order. The objective of this research is to identify the threats and the effects of pornography addiction on adolescents. Considering the dangers of pornography, the authors have conducted a qualitative study to get insights into the pornography phenomena among adolescents and the pornographic implications on the nervous system of the human brain. This study utilized the document analysis method by selecting relevant articles in gathering the research data. In addition, the topic relevant websites were also referred to in getting the sexual-related crimes and misconducts statistical data in Malaysia. Therefore, the study discovered that pornographic phenomena generally are not only an alarming threat in Malaysia but it is also a worrying global menace to humans of all ages. It is found that generation Z between the ages of 11 to 22 years is at utmost high risk due to the group's close inclination attributes with the cyber world. The study also traced some significant clinical and scientific facts which described the hypofrontality syndrome suffered by pornographic addicted individuals which might lead to the risk of mental disorder. In conclusion, pornography has turned out to be a threatening silent enemy that should be addressed properly and of vital concern for all parties within the community.

Keywords

Social Media, Addiction, Internet, Adolescent, Negative Implications

I. INTRODUCTION

The pornography phenomenon has always been one of the most discussed issues of concern among Malaysians. Since the implementation of the Movement Control Order (MCO) on 18 March 2020, it has to some significant extent boosted the use of the internet as the online learning medium among students of all ages in replace of the traditional face-to-face learning in physical classrooms. This is also experienced by adolescents which in a way opens the door even wider than before on their internet presence and cyber world exploration. Without self-control and parental monitoring, such online engagement may lead them into unhealthy dark activities such as pornography and others.

Pornography activities in Malaysia are not only involving adults but also include teenagers who are the future generation that may one day be leaders of the country. The threat of pornography is not only real but also a worrying trend and it should be given the utmost attention by all levels of the community. Parents' role is vital in ensuring the

children's daily online activities are monitored especially during the MCO period where the children are spending most of the time at home undergoing their schooling on online mode due to the closure of schools. Such ample online time and without parental monitoring in a way may provide them with opportunities to freely browse any websites including pornography websites on cyberspace. Therefore, it is essential for parents to always be on alert and oversee their children's activities at home.

In Sweden, a study conducted by a group of researchers on identifying pornography activities among teenagers found that it has become part of their daily routine where 96% of the male respondents are involved with pornography as compared to 54% of the female. The researchers suggested that sex education should be integrated into the school curriculum in order to educate them on the detrimental effects of pornography (Magdalena Mattebo et.al, 2014).

The current modern society considers pornography as a common thing or just as an entertainment-like hobby to fill in leisure time. Some people are considering it as an individual's personal or privacy rights without realizing that such inclination towards pornography is harmful and it leads

to negative implications on individuals and the community at large.

The local mass media has also reported of a new special unit in the Royal Malaysia Police (RMC), called the Malaysia Internet Crime Against Children Investigation Unit (MICAC) was officially established and launched on the 9th of February 2018, functioning mainly to monitor and investigate internet users that visit pornography content materials especially child pornography. MICAC is well equipped with high-tech apparatus so as to enable them to trace the frequency and the types of pornography contents that are uploaded and downloaded by internet users for convictions (Astro Awani, 2018).

In addition, Sinar Harian (12 December 2020), a prominent local newspaper in Malay Language (Bahasa Malaysia) reported that one of the causes of an increasing trend in sexual crimes in Malaysia is the existence of video applications that are easily installed and used to display arousal sexual acts on social media platforms. Shahul Hamid Abd Rahim, a local freelance criminologist states that there is an abundance of pornography elements on social media platforms that are being used as means of getting a huge number of likes and followers. This starts not only from an individual's curiosity about the sexual world and the extra hours influenced of pornography contents but includes the lack of religious educational background and moral values are also seen as causes to the said problem (Raja Nur Faznie Aida, 2020).

II. RESEARCH METHODOLOGY

This research is a qualitative study that employs documents analysis through the use and analysis of data in presenting and elaborating the topic of concern. The gathering of data through document analysis provides the necessary relevant information and discovery of the investigated issue. Analyzing documents is the most convenient resource as they are readily available with the information and doubtlessly reliable and valid (Kamarul Azmi Jasmi, 2012).

This study utilizes library research in order to get domestic and international information related to pornography addiction, criminal cases statistics, and sexual offenses data. The data is needed to test the research hypothesis; the majority of criminal cases and sexual offenses are caused by pornography.

In addition, some data are also gathered in relation to generation Z's inclination towards pornography and the effects of pornography on their brain system in order to get answers to the research questions; Why do the adolescents lose their focus during their education learning process? This question can be answered by referring to scientific research data in the area of neuroscience and psychology on pornography addiction. Based on the above-mentioned sources of data, this study will analyze and elaborate on them for the findings and conclusion.

III. RESEARCH OBJECTIVES

This study aims on analysing the generation Z characteristics and identifying pornography threats on them because it is extremely vital as teenagers are the human capital asset of the

country that shall one day be the leaders of the future. It is with great hope that we are able to mold such young teenagers to become prosperous individuals that are physically, emotionally, spiritually, and intellectually balanced and able to contribute to the nation in the future.

In addition, this study also aims to identify the effects of pornography on the human brain function and system. Realizing the importance of generation Z as the successors of the future leadership of the country, the research team believes that there is a great need in ensuring their education process should be at its best in order to instill the moral values and later develop an outstanding desired personality. Nevertheless, the threat of pornography is real and could possibly to a certain extent detrimental to their (teenagers) cognitive, ethics and behavior. Therefore, they need to be made aware of the effects of pornography and not use their gadgets and the internet for the wrong reason.

IV. LIMITATIONS OF THE STUDY

This study is only analysing the data in relation to generation Z and their addiction to pornography. With reference to generation Z, their identity and characteristics data provides a clear description of the target group in order to determine the approach for in-depth research in the future. During the process of gathering the data and information on pornography, we ensure that the data are able to answer the research questions. Among pornography, descriptions are the definition of pornography, pornography addiction, and its effects on humans.

V. LITERATURE REVIEW

A survey in Klang Valley by the National Population and Family Development Board (NPFDB) of the Ministry of Women, Family and Community Development Malaysia finds that 78.3% of parents allowed their children to own digital gadgets (Mohd Nasarruddi Parzi, 2019). Between 1999 to 2000, there are about 80, 000 pornography websites and there is an increase of 200 new websites every day. According to a Forrester study, there is a boost of 30% in profit equivalent to about USD1 billion gained by the pornography industry. In Japan, there are about 3,000 or 30% of pornography websites on children. In addition, at the beginning of the use of the internet in Japan, over 80% of overall web visits were to pornography websites (Shaikh Mohd Saifuddin, 2000). On the other hand, Malaysia ranks fourth in traffic use of Pornhub, and during the Covid 19 Pandemic period the traffic use increases to 84% (TechNaveBM, 2020).

In the latest analysis by SimilarWeb, as of November 2020, it sees the highest global statistics of access to websites where three out of ten browsings are into pornography websites. In another study by BBFC in 2020 also reveals the statistics of adolescents that are exposed to pornography. It states that the percentage distributions of teenagers involved in pornography activities are as follows; 51% teenagers between the age of 11 to 13, 66% between the age of 14 to 15, and 79% between the age of 16 to 17 (Fight The New Drugs, 2020).

According to a survey on pornography activities that were carried out on 420 children between 9 to 16 years old from several schools in the state of Selangor, discovers that 50% of the respondents are exposed to online pornography. In another study of 860 teenagers between 13 to 18 years in Pulau Pinang, Selangor and Johor state records 36% of them are involved in at least one sexual behavior and 11% have actually engaged in a sexual relationship (Mohd Fadli Othman, 2017).

The 5th Malaysia Population and Family research survey (KPKM-5) by the National Population and Family Development Board (NPFDB) of the Ministry of Women, Family and Community Development Malaysia in 2014 discloses that 35% of teenagers are engaging in pornography resources on the internet, on video CDs and in printed forms. In 2017, joint research by Herriot Watt University of Malaysia and Malaysian Communications and Multimedia Commission discovers that out of 551 school students, 19% are already into pornography at the age of 10 and another 7% even earlier before reaching the age of 8. In addition, the 2017 National Health and Morbidity Survey (NHMS) of twenty-seven thousand adolescents find that six out of seven of the group are active internet users while two out of seven are addicted to the internet (Sinar Harian, 12 March 2019).

The above statistics clearly show that pornography is an alarming threat to children and teenagers globally. Even if it does not seem disastrous but the implications of it may bring harm and adversity to the community and nation. The effects of such treatment could lead to an increase in statistics of sexually related crimes, illegitimate births, gender confusion, destruction of the family institution, the fragility of a social institution, and others.

VI. PORNOGRAPHY AND GENERATION Z

Pornography is a word that represents an open sexual idea through the use of drawings, paintings, and writings. According to online Oxford Learner's Dictionaries (n.d.), pornography refers to "magazines, DVDs, websites, etc. that describe or show [naked](#) people and sexual acts in order to make people feel sexually excited, especially in a way that many other people find offensive". Pornography websites showcase both normal and abnormal sexual conduct based on known human preferences (Nor Azah Abdul Aziz, 2009). Pornography has the same meaning as the word erotic which means stimulating sexual desire, sexual arousal, and sexual excitement (Hajah Noresah Baharom et.al, 2002). It is an act that is against moral values such as revealing one's body and flesh excessively to the extend of arousing the sexual desire of those who watch (Amirul Ashraaf Norman and Nooraini Othman, 2020).

Generation Z is the generation born between 1998 until 2009. This generation is seen as a technology generation because they are exposed to the internet and web since they were young even some are as early as before they were even able to speak. In other words, they are growing in a man-made technological world that connects people regardless of geographical location. The fast-growing technology of this time as the tool for communication is the reality that provides a great advantage to the generation Z. They are always online and communicating with other individuals from all over the

world without any restrictions. Their online communication with friends and even followers at home and abroad is very much seen through their constant presence on social media platforms. Therefore, with such online participation, they are labeled as iGeneration, internet generation, or net generation (Fariza Md Sham, n.d.). Don Tapscott (1999) shares his study in a book 'Growing up Digital: The Rise of the Net Generation' which has introduced the phases of generation. This scholar introduces three levels of the generation that are now popular in use; Generation X, Generation Y, and Generation Z (Hairol Anuar Hj Mak Din, 2017).

In exploring this topic, the researchers are focusing on the characteristics of Generation Z to discover and accurately discuss the connection between Generation Z and the cyber world. A study by Diana G. Oblinger & James L. Oblinger (2005) finds that the characteristics of Generation Z are as follows:

1. Known as *internet generation* or *net generation*, *platinum generation*, and *the native gadget*.
2. *Digital literate*. Utilizing various digital and visual technology and prefer visuals rather than texts.
3. *Prefer networking*. Always in connection using the internet network using any available gadgets such as smartphone, tablet or laptop regardless of locations.
4. *Being instantaneous* in getting information to the extent of not evaluating the accuracy of the information.
5. *Experiential Learner*. Prefer learning from experience rather than being told what they should do.
6. *Social networking*. Prefer to connect with others on social media even with other random unknown social media users, fancy online games, sharing by uploading daily activity photos for public view and etc.
7. *Visual and Kinaesthetic*. Prefer visual stimulus rather than textual in comprehending instructions or processing knowledge-based information.

It is clear that Generation Z is a group of generations that is very different in terms of their interest, skills, cognitive, behavior, and action compared to other generations. Their characteristics are shaped by social media and technological development which are greatly influencing and shaping their psychological state and way of thinking. Their obsession with the cyber world and social media reduces their direct connection and communication with people around them but they are in contact with virtual friends all over the world without really knowing their background. This condition affects their value orientation development that does not confine only to the traditional values and norms that are within their own societal origin (Fariza Md Sham, n.d.).

VII. THE ROLES OF PARENTS, TEACHERS, AND GOVERNMENT AGENCIES

Many parents do not expect that their children dare to visit pornography websites because of their own lack of awareness of the threat of pornography and the sexual development of their children. Sexual development does not only involve fulfilling sexual desire but also includes the shaping of values, attitudes, feelings, identity, interaction, and individual orientation (Margareta, 2016).

During children's sexual development, they do not think of sex in the same way as adults. At the phase of sexual development, their thinking of their own sexual development covers the emotional, social, cultural, and physical aspects. Therefore, parental guidance is very much necessary and vital in giving a clear explanation of what is right and wrong in the process. Everything that they learn, think, and feel about sex shall determine their attitude and behavior of their sexual life in the future. Therefore, parents need to comprehend this and assist their children so that their sexual development process progresses in a healthy manner (Margareta, 2016).

Islam describes in detail the aspect of children's sexual education that includes dress code, the command to cover one's body parts, observing the relationship between men and women, and also to abstain one's vision from seeing or looking at forbidden things. In the Quran, surah Al-Nur (The Light) verse 58 states about the restriction of entering parents' bedroom during three specific times; before dawn, before afternoon prayer (*Zohor*) time, and after night prayer (*Isyak*) time. The three mentioned times are the parents' private time when they are resting in their room. Such restriction in Islam is aimed at teaching the children manners and to avoid them from seeing any adult couple's sexual behavior that might be detrimental to the children's thinking and perceptions. Islam even stresses the need to teach children to ask permission by knocking on the door if they want to enter their parents' bedroom.

Islam clearly forbids pornography activities as commanded by Allah SWT in Surah An-Nur (The Light) verse 30 and 31: *"O Prophet! Tell the believing men to lower their gaze and guard their chastity. That is purer for them. Surely Allah is All-Aware of what they do"* (30)

"And tell the believing women to lower their gaze and guard their chastity, and not to reveal their adornments except what normally appears. Let them draw their veils over their chests, and not reveal their hidden adornments except to their husbands, their fathers, their fathers-in-law, their sons, their stepsons, their brothers, their brothers' sons or sisters' sons, their fellow women, those bondwomen in their possession, male attendants with no desire, or children who are still unaware of women's nakedness. Let them not stamp their feet, drawing attention to their hidden adornments. Turn to Allah in repentance all together, O believers, so that you may be successful" (31)

The words *yaghuddhu min absarihim* and *'yaghdudna min absarihin'* in the above verses 30 and 31 describe the obligation of withholding one's vision of looking at views that are forbidden by Allah SWT. According to *fiqh* scholars, our vision may open the door to immoral behaviors that make our heart and mind full of imaginations, desires and may lead to curiosities. Such a state may influence one into slander, adultery, and sexual misconduct.

Implicitly, the above verses criticize and condemn those who like to look at activities that are forbidden by Allah. When the vision accidentally looks at something bad or forbidden, one should immediately look the other way or lower down the look (Wahbah az-Zuhaili, 2005). This study notices Prof. Dr. Wahbah az-Zuhaili's discussion includes pornography

images that have the tendency to stimulate human sexual desires and drive them into real sexual activities.

Other religious scholars' views in the context of the above verses are in agreement that by controlling our vision we are able to safeguard our self-honor and dignity as well as having a pure heart. On the contrary, if there is no such control, eyes that are given the freedom to see and look at forbidden negative views might penetrate one's pure inner-self and create imaginary long-lasting negative visions. This might influence one into long-term negative imagination period and keep them away from doing good deeds (Nur Mohamad Hadi Zahalan, 2019).

Islamic teachings on manners and good behavior should also be taught in schools so as to strengthen the children's positive sexual development. Parents are not the only ones responsible to teach the younger generation, teachers are also expected to instill manners and good moral values through the school curriculum. Schools need to create awareness of the threats and dangers of pornography among the learners through antipornography and antipornoact campaigns and awareness activities. According to Mohd Fadhli Othman (2017), school management, district education offices, and state education departments are giving less attention to pornography awareness campaigns due to difficulty in tracing the said issue among the students.

Teenagers' pornography activities are usually done in isolation and are not disclosed to the public and parents. Nevertheless, there are those who secretly share their experiences, pornography images, and pornography websites information or links among their friends. At times, they do watch pornography videos together and even talk about it among them. Such situations impede many concerned parties in identifying the existence of pornography involvement among the youth. Realizing that generation Z is highly influenced by the internet and gadgets, teachers and parents should be equipped with techniques on how to approach them in order to overcome this issue of pornography addiction more effectively.

Despite the obstacles, it is a relief that recently, The Royal Malaysian Police (RMP) and the Ministry of Communications and Multimedia (MCMC) are now monitoring and investigating the internet users' activities on pornography websites. The authorities are taking stricter action by blocking access to those pornography websites and this is done immediately by the Malaysian Communications and Multimedia Commission (MCMC) once such user is identified. Other than pornography websites, gambling websites are being monitored as well as they are also seen as detrimental to the Malaysian community (Astro Awani, 2018).

VIII. RESEARCH FINDINGS

Based on the qualitative evaluation, the research findings are discussed in two sections: First, the implications of pornography to the community; Second, the implications of pornography to individuals.

The library research finds that pornography exposes the community to safety threats from sexual crimes such as rapes, molests, pedophilias, paraphilias and etc. These sexual-related crimes are frequently reported in the mass

media. To a certain extent, such sexual crimes may lead the sexual crime culprits into committing murder. In addition, the effect of pornography activities may drive an individual into sexual misconduct such as masturbation, adultery, and incest. Moreover, its negative implication is more harmful which may cause further social issues such as pregnancy before marriage, an illegitimate birth, baby dumping, and the spread of sexually related diseases such as HIV/AIDS and others.

The Women and Children Criminal Investigation Division of the Royal Malaysian Police headquarters in Bukit Aman reveals a total of 89% of sexual crimes happened in homes for the period of three years from 2015 to 2017 and only 11% of such crimes occurred outside of residences (Almaswa Haji Che Ros, 2017). The statistics clearly show that the majority of the cases involve known predatory offenders such as among family members, relatives, neighbors, and friends which are possibly caused by pornography activities that are always in closed locations like homes and other private spaces.

In 2018, the RMP reported a total of 1921 cases of child sexual abuse but the Interpol says that there are possibly many unreported cases that are not disclosed to the authorities. This is due to the eastern culture of being rather silent about such crimes out of shame and disgrace (Odisi, 2019).

My Metro (2019) reported that statistical reports on baby dumping cases discovered by the Department of Social Welfare Malaysia (DSW) and its partnership with the Royal Malaysian Police (RMC) see a considerable increase between 2014 to 2018. Within the duration, a total of 577 cases of baby dumping are reported and are divided by; 103 cases in 2014, 111 cases in 2015, 115 cases in 2016, 120 cases in 2017, and 128 cases in 2018. In addition, there are 2720 reported cases of pregnancy outside of marriage in 2016 (Namri Sidek, 2018).

The above statistics clearly show the increase in crimes and sexual misconduct in the country. Looking at the figures, it is undoubtedly that the cause of the issue is lack of self-control which is further supported by pornography threat. The availability of many pornography photos that are easily accessed through the internet and gadgets in a way encourages the offenders to be even more aggressive. The pornography materials are also giving ideas to the offenders which they then replicate the sexual act that they have watched. This study is also investigating the causes of lack of self-control from the neurological perspective.

In discussing the pornography implications on individuals, this paper elaborates on how the addiction to pornography damages the human's nerve system by analyzing scientific and clinical studies.

The human brain consists of two systems, which are the director (prefrontal cortex/PFC) and responder (limbic system). The directory system (director) relates to the ability to think rationally. The Prefrontal Cortex (PFC) is responsible for decision making, specifying priority, analyzing risk, and performing the evaluation. However, PFC is not fully grown yet at adolescent age but shall only be perfectly developed between 24 to 25 years of age (Mohd Fadhli Othman, 2017). Whereas, the limbic system refers to the brain structure related to emotions such as anger, happiness, and fear. The limbic system is also known as a responder that arranges behavior, intentions, emotions, memory, motivation, and responsive reflects. This system promotes an individual's sense of calm, satisfaction, and enjoyment (Mohd Fadhli Othman, 2017). In a normal condition, the limbic system responder acts to stop the brain process when

it achieves its aims and needs but it does not happen if someone is experiencing hypofrontality syndrome.

When someone watches pornography images, the brain releases dopamine that causes the person to feel calm, excited, and happy. Dopamine is a hormone and one of the neurotransmitters that control actions, emotions, motivation, and happiness. Dopamine increases as and when it processes new stimulants. In the case of pornography addiction, dopamine intensifies if stimulant appears more than it should be (Mustika, 2018).

In a study by a group of neurology researchers on pornography addiction from the neurological point of view, Donald L. Hilton (2011) states that all kinds of addiction shall cause chemical, anatomy, and pathology changes including pornography addiction. This condition causes the brain cerebral cease to function collectively and is called hypofrontality syndrome. Hypofrontal syndrome is a condition that can be said as the loss of control of the frontal control system. In addition, such a condition usually happens anatomically after traumas. Nevertheless, hypofrontality may happen in cases of pornography addiction and could cause damage to the "brake system" of the human brain. The hypofrontality syndrome that occurs due to pornography addiction causes the brain's director system at the Prefrontal Cortex (PFC) is not able to stop the production of dopamine hormone that plays a role in how we feel pleasure. Such reaction makes an individual unable to reach the maximum pleasure satisfaction and that in turn encourages them to repeat and try in a more aggressive manner.

Among the main characteristics of hypofrontality is the emergence of impulsive (impulsivity) and compulsive (compulsivity) acts, weak control of emotions (emotional lability), and difficulty in making a judgment (impaired judgment) (Donald L. Hilton, 2011). Impulsivity is a spontaneous instinctive reaction without putting in any thoughts before reacting to any situations which may cause someone into taking the wrong choice or decision due to the absence of thinking before doing. It may also cause the feeling of regret and guilt after realizing what had been done wrong which may prolong until it could probably lead to pressure that causes stress and depression. On the other hand, compulsivity is a drive to act until someone feels comfortable and reaches perfection. Someone with compulsivity normally has perfectionist and obsessive characteristics to the extent of repeating the action until he or she is satisfied.

Analyzing the effects of pornography addiction on the human brain from the psychological and neurological aspects, this study concludes that pornography addiction causes interferences to the brain system of individuals until they are not able to think wisely and act appropriately and the condition may even be worse when the long duration of exposure to pornography leads to addiction. This fact explains the connection between the two variables which are the frequency of sexual misconduct and the duration of time of the involvement in pornography activities. Therefore, it is not a surprise to see the rise in the sexual crime rate of the country because pornography activities are still very much happening widely. Criminal and sexual cases seem difficult to control until stricter, stern, and comprehensive actions are carried out on blocking access to pornography.

IX. CONCLUSION

The world of the internet and gadgets is synonymous with generation Z. It is impossible for them to forego gadgets, social media, and the internet because their life surrounds these resources. Moreover, most of their daily learning tasks and

assignments are done based on the resources on the internet through the use of various gadgets.

Even though it is clearly informed that pornography with its availability through the internet, social media, and gadgets, leads to negativity, but efforts on separating them from their gadgets and access to the internet can be said as an almost impossible task. A possible solution is to educate them on the proper use of gadgets and the internet. They need the awareness of integrity and responsibility so as to ensure that they do not misuse the internet for pornography activities that are detrimental to their mental, physical health, emotions as well as morals.

Such effort is extremely needed by providing them with the knowledge, comprehension, and awareness about the dangers of sexual deviation and pornography until they understand the possibility of a second implication out of such misconduct (Agus Gunawan, 2016). Therefore, comprehensive campaigns against pornography should be a collaborative effort by all stakeholders and actions should follow accordingly.

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Experiences of Patients with Pulmonary Tuberculosis: Input to Healthcare Strategies and Programs

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Abstract

This study aimed to explore the experiences of patients with pulmonary tuberculosis in terms of physical, social, emotional, mental and spiritual aspects of life as basis for inputs to healthcare strategies and programs. The study utilizes qualitative research wherein interviews were done to get data saturation from the informants. There were ten informants chosen from the top barangay which has the highest incidence of pulmonary tuberculosis in Batangas City. Findings showed that patients with pulmonary tuberculosis often experience changes in their routines and activities. They isolate themselves from others as a result of stigma. Additionally, tuberculosis can cause depression and can affect the decision-making skills of patients having the disease. Hence tuberculosis can strengthen one's faith in God. Meanwhile, the TB program of the Department of Health greatly contributes to the betterment of patients. Moreover, the community health workers should continue educating the community people that they should not limit their activities but instead engage themselves in healthy activities to promote wellness. Government should allocate more nurses in the community to promote home visit that can increase case finding. By this, nurses will look for patients with tuberculosis instead of waiting for the patients to consult the health center.

Keywords

pulmonary tuberculosis, health strategies and programs, experiences

I. INTRODUCTION

Diseases that arose around the world affect every country's health system. One of the diseases that is continuing to infect globally is the tuberculosis disease (Churchyard et al., 2017). This remains one of the worldwide health problems faced by every country with vast implications of an approximate case of 10.4 million of this disease last 2015. In order to cease the epidemic of the tuberculosis, it is crucial to obstruct its transmission. Further, the intercessions needed to intrude on tuberculosis transmission should be focused to high-chance gatherings and settings. Interventions that focused on intruding the tuberculosis transmission and speeding up the decrease in tuberculosis frequency and mortality around the world. This article also provided information to give a significant level outline of what was thought about tuberculosis transmission, utilizing the tuberculosis transmission course as a structure, and to lay the right foundation for the articles in this arrangement, which address explicit parts of tuberculosis transmission.

In India, 2.7 million people were affected by the tuberculosis last 2017. Eventhough the Revised National TB Control Programme had achieved their milestone in coverage, the quality of how they care and treat patients with tuberculosis remained to be significantly low which is not enough to combat the raising cases of this disease. Low patient care can be an effect of provider's knowledge and practice where it had be a factor why patients consistently lost to follow-up. The study by Bhatnagar (2017), aimed to integrate facts that

served as evidence on patient's experience and satisfaction with their TB care in India and to formulate an improved quality service. The study reported that poor user-experience encounters were regularly liable for patients interfering with treatment or exiting their TB care. Patient-centeredness, or ease of use of TB care can be improved by presenting individualized or adaptable DOTS that was receptive to client conditions and needs. Client experience information ought to be deliberately gathered utilizing a normalized, public instrument for ID of explicit bottlenecks and achievements in nature of TB care from the patients' point of view.

Tuberculosis (TB) treatment in the Philippines is an important component of community health programs. It affects all domains of quality of life, including general health perceptions, somatic sensation, psychological health. Spiritual well-being, and physical, social and role functioning.

Eradication of tuberculosis is one of the priorities of the Department of Health because it still the main cause of mortality and morbidity. The fact is true that there are still people who create social stigma to these patients who have TB as they have the belief that it is very contagious and they can acquire the disease.

In line with this, Department of Health (DOH) launched a program called Directly Observed Treatment Short course (TB-DOTS), the National Center for Disease Prevention and Control of the DOH lead a program to reduce the incidence in our country. Despite several programs, still the country has an increasing number of cases, ignorance remains high, and

the stigma still associated with it keeps people from seeking treatment.

Thus, one of the most common problems of TB patients is the feeling of being unaccepted and lacking of social support from families and friends. Having TB will make the patients feel isolated; hence, an awareness of patients' experiences can help nurses to understand behaviors so that appropriate and proper interventions can be applied towards recovery from illness. Nurses have the responsibility of making these patients feel not isolated as well as providing emotional help and interventions for recovery of the disease.

II. RESEARCH OBJECTIVES

The researcher engaged in this study to find out the lived experiences of patients with Pulmonary Tuberculosis. Specifically, it sought to explore the experiences of patients with pulmonary tuberculosis in terms of psychological aspects of life, thus serves as basis for inputs to healthcare strategies and programs.

III. RECONNAISSANCE

In the United States, it was said that tuberculosis was still a public health problem particularly people with immunosuppressed condition and other groups which have a higher susceptibility of risks. Tuberculosis disease is obtained in active and latent forms. Active disease can happen as primary tuberculosis, growing soon after disease, or postprimary tuberculosis, creating after an extensive stretch of inactive contamination. In the other hand the latent tuberculosis is a category which causes asymptomatic infection that may lead to postprimary infection (Nachiappan, et.al. 2017).

Like any other disease that occur, tuberculosis can be treated, prevented and cured. In the study by Reid (2019), during the 50 years that had passed dealing the pandemic that killed many people, ending the problem with tuberculosis was discovered to be achievable. With the hope of ending this disease that killed hundreds of millions in the past few years, last 2017, elevated number of cases who died from getting infected of tuberculosis was 1.6 million people which was recorded to be the highest death than any other infectious diseases. The world can at this point does not disregard the colossal pall casted by the tuberculosis scourge. Going ahead, the worldwide tuberculosis reaction should be a comprehensive, extensive reaction inside the more extensive maintainable advancement plan.

On the meeting held by the United Nations General Assembly High Level last September 26, 2018, they tackled the tuberculosis infection. With the commitment of every UN Member State, they supported to end the global tuberculosis pandemic which is estimated until the year 2030. In accordance, the WHO published the Global Tuberculosis Report last Oct 17, 2019. The report specifies date from 202 countries and territories which is approximately 99% of the population of the world and the number of tuberculosis cases. In the year 2020, tuberculosis still holds the record for the highest mortality from any infectious diseases worldwide. The WHO added in their report that the current action of progress is not sufficient: the worldwide total pace of

decrease for tuberculosis frequency was just 6.3% somewhere in the range of 2015 and 2018, which was substantially less than that of the 2020 achievement of 20% (Harding, 2019).

In connection, a study conducted by Imperial (2018), also stated that tuberculosis killed more people compared to other infectious diseases that arose. In his study, he conducted a three pivotal trials testing 4-month regimen that failed to meet non-inferiority margins. However, four-fifths of participants were cured. Through a pooled investigation of patient-level information with outside approval, they distinguished the populaces qualified for 4-month treatment, characterized aggregates that were difficult to treat and assess the effect of adherence and dosing procedure on results. In 3,405 members remembered for investigations, standard smear evaluation of 3+ comparative with <2+, HIV seropositivity and adherence of $\leq 90\%$ were huge danger factors for ominous result. Four-month regimens were non-standard in members with negligible infection characterized by <2+ sputum smear grade or non-cavitary illness. A difficult to-treat aggregate, characterized by high smear evaluations and cavitation, may require spans >6 months to fix all. Routine length can be chosen to improve results, giving a separated medication approach as an option in contrast to the 'one-size-fits-all' treatment as of now utilized around the world.

In the Philippines, tuberculosis (TB) landed as the sixth leading cause of morbidity and mortality even there was an evident progress that had been made in the detection and cure of TB under the Directly Observed Treatment Short Course because the combat in opposition to the disease was a heavy task to do. Jung and Kim (2018) added that in order for the tuberculosis management to develop, it needed coordinated and collaborative efforts for a specific and effective interventions. Thus, a mathematical TB model that was fitted to the Philippine data was organized to understand its transmission dynamics.

The spread of tuberculosis disease in the Philippines and strategies in mitigating and controlling the persistent elevation of cases were the focus of Jung and Kim's (2018) study where they suggested strategies for the reduction of high risk latent and infections TB patient with a minimal intervention implementation costs. Suggestions such as distancing control were determined to be the most systematic way when a single intervention was utilized. However, it was an intimidating duty to implement a full scale employment of the distancing control because the burden can be lessened by the combination of other control interventions. At the end of their study they found that improving dynamic case discovering control rather than case holding control along with separating and inert case discovering control appeared to have huge potential for reducing the spread of TB in the Philippines.

Treatment, vaccines and other medications that were implemented for more than 50 years were effective but unfortunately this disease still endure and topped as the leading cause or mortality worldwide especially in the Philippines. The growing cases of tuberculosis patients in the Philippines were because of symptomatic patients that avoided to seek for care or medications. Through a study by

Banay, Garfin, Kau, Smith, and Zimmerman (2020), Philippines investigated barriers to seek care that used behavioral science lens. The findings that the barriers such as ; ambiguous symptoms; association of TB risk with lifestyle and habits; expectations of stigma, discrimination, isolation; short-term costs; long-term financial burden of TB; to undergo for a medical intervention. A more perceived benefits and setting the perceived costs in a proper perspective were the suggested method for a more effective improvement.

In relation to the study mentioned, White (2020) said that regardless of the advancement in diagnosis and treatment for tuberculosis, it stays as a health burden in the world because it is the leading cause of death from a single infectious agent. Some of the risk factors of tuberculosis that were determined were undernutrition and diabetes. These two conditions were in lined with the nutritional origin which increases mortality and adverse outcome when not prevented. Through the implementation of the “END TB Strategy,” it was advised that “All persons with TB need to be assessed for nutritional status and should receive nutritional counselling and care according to need.” Additionally, “all persons with TB should be screened for diabetes” and, “in addition to HIV/AIDS, other co-morbidities and health risks associated with TB require integrated management” thus in the middle and low class country, it was a challenge to implement this strategy because their financial ability was the major problem that even enough nutritious food a day was difficult for them. Diabetes and under nutrition can increase risk with other health problems and a higher susceptibility to be infected with tuberculosis.

Worldwide, case identification of TB has been sustained, wherein approximately 4.3 million cases were assessed to be either not analyzed or not advised. Constraints of the DOTS system which have zeroed in on detached case discovering (PCF) by smear microscopy among indicative people have been progressively perceived. Morishita (2017) stated that because of this, directed dynamic case discovering (ACF) has recaptured an expanded consideration as a corresponding system to fill the case recognition hole. For the last one and half many years, enormous benefactor reserves have been activated worldwide and various ACF projects have been carried out in high and moderate weight nations to animate and accumulate worldwide proof. The World Health Organization (WHO) encouraged a survey of accessible proof and gave standards and suggestions on methodical evaluating for dynamic TB . On a fundamental level, orderly screening including ACF should target explicit gatherings that are at high danger of TB or have helpless admittance to TB administrations, or both . As indicated by the WHO rules, it was firmly suggested for individuals living with human immunodeficiency infection (HIV), close contacts of individuals with TB, and individuals presented to silica, and restrictively suggested for different gatherings like detainees, travelers, individuals with diabetes mellitus, and metropolitan ghettos occupants.

In the indigenous and non-indigenous populace in many countries around the world, including Australia, the discrepancy in tuberculosis (TB) rates exist. The social determinants of well-being were the key to well-being

imbalances remembering incongruities for TB rates. There are restrictions in the predominant biomedical and epidemiological ways to deal with addressing, understanding and tending to the inconsistent weight of TB for Indigenous people groups addressed in the writing. Hence, the mentioned paper applies a social determinant of well-being approach and analyzes the underlying, automatic and verifiable reasons for imbalances for TB in Indigenous Australia (Devlin, Judd, MacLaren, Massey, & Widders, 2019).

Meanwhile Mayan, Gokiart, Robinson, Tremblay, Abonyi, Morley, Long, (2019) mentioned that the indigenous people living in Canada encountered disproportionately high tuberculosis (TB) rates while those in the prairie areas have the advanced TB presentation. The environment has seen to influence the elevating rates of the tuberculosis cases. This explained why the community of indigenous people has a higher number of cases wherein the delay of accurate diagnoses, conserved stigma and shame, and their limiting understanding of the disease greatly affect the spread of the tuberculosis. Members living in urban communities experienced critical challenges getting a precise conclusion. Tuberculosis data littly affected members' TB information, paying little heed to where they lived. Various misdiagnoses principally among urban focus members, being disgraced for having the illness and an absence of comprehension of TB would all be able to add to cutting edge introductions and high paces of the sickness among Indigenous Peoples of the Prairie Provinces. In the urban populace, misdiagnoses can be present, what more in the indigenous area wherein absence technology and shame can be a lot more problem.

The way a patient was taken care or treated can be a great factor to his or her immediate recovery from a disease. This was supported by a study conducted by Cazabon and Pai (2020), wherein they stated that a patient-centered care can lead the End TB strategy. Evaluating patient’s experience and satisfaction with the various tuberculosis services has shown that mostly satisfied users with the TB care they have been provided are more likely to attend for the follow-up medications. Meanwhile, those dissatisfied patients were unlikely to be back for follow-up. The high fulfillment rates might have been because of absence of training on great quality patient consideration or dread of losing admittance to medical care. A normalized patient focused device could be intended to help survey client experience and patient fulfillment to permit correlations among wellbeing frameworks and nations.

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IV. METHOD

Research Design

Qualitative -phenomenological research was used in exploring and understanding TB patients' everyday life experiences. According to Neubauer, Witkop and Varpio (2019), phenomenological research was defined as an approach to research wherein their objective is to describe the essence of phenomenon through seeking the perspective of people who experience a specific topic. This helped the researchers to study the lived experiences of patients with pulmonary tuberculosis.

Locale

The researcher got the qualitative sample through purposive sampling method in the selected barangay in Batangas City, with the highest incidence of TB according to the record of City Health Office.

Informants

This study had thirty (30) informants who met the criteria set forth by the researcher, namely: patients with pulmonary tuberculosis and who are currently undergoing treatment.

Instrument

The interview questions that were used were self-made interview guide questions to cite the informants' experiences in terms of physical, social, emotional, mental and spiritual aspects of life.

Data Collection Procedure

The research was conducted with the use of systematic procedure, wherein, the title and objectives were pre-approved by the Dean and Director of Research Center. The interview guide questions were also validated by some clinical instructors who are expert in Community Health Nursing.

The researcher was guided by the phenomenological steps provided by Streubert, which begin with the process of bracketing, to explicate the researchers own beliefs and biases so as to avoid influencing the results of the data collection.

To avoid interrupting their activities in their homes, interviews were conducted on their convenient time. The interview was conducted in a quiet, conducive to conversation and secure location to give more ease for the informants. The interview lasted from 25 to 35 minutes.

The informants were briefed, that they would be doing a semi-structured, face-to-face interview and that follow up questions may ensue depending on the information that they provide. In addition, the interview was audio-recorded, thus the informants were made aware of the presence of an audio recorder, which was used throughout the interview. Confidentiality was exercised utmost and the informants could answer in Filipino. Data generation continued until such time that data saturation was achieved.

The researcher listened to the audio-recordings of each informant and transcribed it verbatim using oTranscribe, a

free web application that is open sourced. The transcripts were then printed and analyzed.

Data Analysis

Data analysis was done to ensure that the uniqueness of each participant's lived experience is preserved while the researcher attempted to understand the phenomenon under investigation by dwelling and becoming immersed with the data. To aid in the data analysis, the researcher used the steps provided in Colaizzi's process for phenomenological data analysis. These steps included the reading and re-reading of transcript to obtain a general sense about the whole content. Each transcript has significant statements that pertain to the phenomenon under study should be extracted. These statements are recorded on a separate sheet noting their pages and line numbers and their meaning were formulated from these significant statements. Hence, the formulated meanings were sorted into categories, clusters of themes, and themes. The findings of the study were integrated into an exhaustive description of the phenomenon under study. Likewise, the fundamental structure of the phenomenon was described. Finally, validation of the findings was sought from the research informants to compare the researcher's descriptive results with their experiences.

Ethical Considerations

The protection of informants and the consideration of their rights are the moral obligations of a researcher in all research studies. The ethical standards are as important in quantitative research as in qualitative research. In qualitative research, the ethical standards must evolve from the fact that it is dynamic and the researcher must remain alert to the possibility of unanticipated ethical concerns. In addition, the evolving standards must root themselves from the basic ethical principles of autonomy, beneficence and justice (Streubert & Carpenter, 2015). Thus, this study utilized the ethical measures of informed consent and voluntary informant participation, right to withdraw from the study, confidentiality, privacy, and the dissemination of results.

V. RESULTS AND DISCUSSION

Based on the results of the in-depth interview that were transcribed and analysed, the following themes were identified:

1. Physical Effects of Tuberculosis

Tuberculosis is still on the list of top health problems that causes mortality in the Philippines. It mainly affects the lung parenchyma that causes a wide variety of symptoms such as chronic cough, fever night sweat and weight loss. It also causes low immunity and makes patient weak that result to limited activities of daily living as attested by the informants. In the physical aspect, the informants divulged that the signs and symptoms they experienced were body weaknesses, fever, cough, body pains, shortness of breath and hemoptysis. These are the results of their compromised or inadequate immune system response resulting in further progression of disease.

This agrees to the article by Khatri (2020), which stated that the signs and symptoms of tuberculosis disease are insidious. Thus, most patients experience cough, chest pain, coughing up blood, feeling tired all the time, night sweats, chills, fever, loss of appetite and weight loss. The cough may be

nonproductive, or mucopurulent sputum may be expectorated. Both systemic and pulmonary symptoms were chronic and may have been present for weeks to months. Elderly patients usually present with less pronounced symptoms than younger patients.

Moreover, when asked about the physical changes they felt when they learned about their condition, most of the informants stated that the activities they did before the onset of their disease cannot be done now that they are ill. They said that they reduced their amount of activities into which they can tolerate them, and even their children were also affected.

Moreover, when asked about the physical changes they noticed when they learned their condition, some of the informants divulged that their hobbies were also affected by their disease. Aside from their activities, the time they do it was also affected because the rest they needed will make them recover swiftly. Various activities such as playing sports, cooking, doing household chores and driving was also lessened into a tolerable scale because of their condition.

Another physical adjustment the patients felt was they cannot resume to their work and their household chores since they are disabled by their diseases. They worry that their body cannot exert more and that they might spread their disease. Some of the informants were greatly affected by their disease to the point that they cannot resume to work.

Basaraba and Hunter (2017) said that the progress of this disease can be transmitted through intrabronchiolar and lymphatic routes. Thus, people with tuberculosis disease of the lungs or throat were probably infectious, patients need to stay at home from work or school to lessen the spread of the TB bacteria.

Tuberculosis, being a highly infectious disease that primarily involves the respiratory system, also affects other organs of the body. Notable signs and symptoms are chronic cough, chest and back pains, weight loss, sweating, fatigue and body malaise. These were experienced by the patients which impaired their ability to perform various tasks thus further invalidating them to do household chores or to work.

Based on the interview, limited activity of daily living and inability to perform their hobbies and chores that they usually do before they have contracted their disease were identified as the physical effects of tuberculosis. Hence this was supported in the study of Van Aswege and Roos (2017) wherein they stated that activities and physical impairments became limited to people who experienced tuberculosis.

2. Social Effects of Tuberculosis

Isolating Oneself to Others/ Social Stigma

One of the most common problems of PTB patients is the feeling of being unaccepted and lacking of social support. Having a communicable disease such as PTB will make the patients feel isolated. Many patients experience isolation and stigma as their families and friends avoided or shunned them. Patients responded to these attitudes by isolating themselves and becoming secretive about their illness. Most of the informants admitted that they isolate themselves from their family and friends in various social gatherings in order for them to not spread their disease. Another is that they are afraid that they will be judged due to their illnesses.

Mayan, Gokiart, Robinson, Tremblay, Abonyi, Morley, and Long, (2019) mentioned that the indigenous people living in Canada encountered disproportionately high tuberculosis (TB) rates while those in the prairie areas have the advanced TB presentation. The environment have seen to influence the elevating rates of the tuberculosis cases. This explained why the community of indigenous people have a higher number of cases. Hence, the delay of accurate diagnoses, conserved stigma and shame, and their limiting understanding of the disease greatly affect the spread of the tuberculosis. Members living in urban communities experienced critical challenges getting a precise conclusion. Tuberculosis data little affected members' TB information, paying little heed to where they lived. Various misdiagnoses principally among urban focus members, being disgraced for having the illness and an absence of comprehension of TB would all be able to add to cutting edge introductions and high paces of the sickness among Indigenous Peoples of the Prairie Provinces. In the urban populace, misdiagnoses can be present, this is also present in the indigenous area wherein absence technology and shame can be a lot more problem.

The lack of knowledge of other people regarding their disease resulted to them being judged and discriminated. Some of them tried to avoid social encounters while others were supported by their family and friends in facing the trials they faced during the onset of their disease.

They even admitted that separating themselves is a sacrifice in order for their family and friends to be safe. Moreover, they felt the need to isolate themselves in order to prevent further judgement casted by others.

In a study that was published by Datiko, Jerene, and Suarez (2020), it was mentioned that despite the effort of the different health agency to find and treat tuberculosis, there were four million that were missed last 2017 due to barriers like poor socioeconomic conditions and stigma among the people. Unfortunately, tuberculosis related stigma remains unexplored.

Stigma associated with many diseases is a result of prejudice, which can be split into two categories: instrumental and symbolic attitudes. Some of the multiple causes are conjectured to be fear of infection or pollution, fear of the different, association of the condition with poverty or other discrediting factors, and a means of upholding existing power differentials. There may be considerable ambivalence in the minds of health workers and family members as they attempt to balance desires to help sufferers while still retaining prejudices and behaving in discriminatory ways. The impact on sufferers is considerable, yet there is little understanding of the precise nature of the causes of stigma and discrimination.

Patients often isolate themselves to avoid infecting others and to avoid uncomfortable situations such as being shunned or becoming the subject of gossip. Being either a patient or an ex-patient is likely to affect employment and employment prospects. Unmarried women often find it difficult to get married, due to discrimination by prospective husbands and in-laws, while married women may find they are divorced because they have TB or if a history of TB is subsequently revealed. Another concern about being identified as a person with TB is it makes it more difficult for people with a cough

of long duration to seek care, because of the public nature of the TB diagnostic process. By delaying seeking care, these people may develop more serious symptoms, meaning they will be more difficult to treat; and as they remain infectious for longer, they are more likely to transmit the disease to others. Second, concerns about stigma and discrimination for TB make it more difficult for patients to continue with care, because their fears of being identified as being, or having been infected with TB hinder their access to services on a daily basis.

3. Emotional Effects of Tuberculosis

Feeling of Depression

Patients with pulmonary tuberculosis experience depression due to the sudden change in their health condition and lifestyle. This also occur as the result of stigma and they consider it as a burden for them and to their family. The informants stated that they were sad when they found out that they have tuberculosis since most of them do not have any vices that will serve as a factor of the development of their disease. Moreover, they were affected by the reaction given to them by other people.

Individuals who endure tuberculosis face clinical and cultural outcomes after recuperation, including expanded dangers of repetitive tuberculosis, unexpected passing, decreased lung work, and continuous shame (Dodd & Seddon, 2021). This is supported in an article by Cattamanchi (2018), which stated that tuberculosis disease can cause life-threatening complications when not treated accordingly like permanent lung damage.

Patients with MDR TB face broad psychosocial challenges including sadness, stress, shame and discrimination. These difficulties may reach out to losing their employment when the conclusion is found, diminished marriage possibilities, absence of social help and monetary weights. The outcomes of disgrace bring about low confidence, trouble, segregation, social avoidance and detachment which thusly lead to a diminished HRQOL, non-divulgence and difficulties with treatment adherence (Roba, 2018).

4. Mental effects of Tuberculosis

Altered Decision Making

Patients with tuberculosis often think first of their condition and others in making a decision. Some even experienced thinking twice before arriving at decisions. Health education was essential to engage patients and empower their commitment towards tuberculosis (TB) control. Thus, despite all the efforts at raising awareness, ignorance about tuberculosis remains high and the stigma still associated with it keeps people from seeking treatment (Kigozi, Heunis, Engelbrecht, Jansvan Rensburg & Dingie van Rensburg, 2017).

When asked about the mental effects their disease has brought to them, they said that they had to really think wisely when it comes to decision making. Now, they have to put into consideration their disease and those others who will be affected by it.

With their disease in mind, they always have a lapse in their judgment since they always think of what others will say regarding their disease or they always put in their minds that if they engage in activities that will tire them then the progress of their recovery will be slowed down.

The manifestations of the resiliency that patients demonstrated and how tuberculosis impacted on decisions involving treatment seeking and their adherence are shown in the study of Cremers et al. (2018). It highlighted patients' strategies for adapting to adversities, such as pausing TB treatment when lacking food to avoid becoming psychotic, consuming alcohol to better cope, obtaining social grants, and avoiding stigmatizing attitudes

Moreover, as stated by Craig and Loannaki (2016) Tuberculosis (TB) related stigma was a significant social determinant of well-being. Examination by and large features how disgrace can significantly affect people and networks, remembering delays for looking for medical services and adherence to therapy.

5. Spiritual Effects of Tuberculosis

Strengthened Spirituality

During the interview, the informants were asked about their spirituality in connection with their disease encounters. They were asked about their faith in God after having their disease and yet their responses were all optimistic. The informants did not blame God for their conditions, but instead their faith was strengthened. Some informants mentioned that though they cannot attend mass every Sunday, at least they are praying and still believing God. All of the informants agreed that their faith in God is the best treatment that they could ever have.

It is apparent with the informants' testimonies that their Faith in God is the greatest weapon they have against their diseases. This also proves that their belief that they will be spiritually strengthened in dire times is the only thing that keeps them from not giving up and succumbing to the debilitating ability their disease can bring to them.

The informants of the study kept their strong faith in God; they did not blame Him for what happened to them. Despite their condition, their faith has strengthened and instead of blaming God they always asked for his guidance. Religions tend to refer to aspects of beliefs and behavior, including spirituality, that are related to the sacred or supernatural and are grounded in a religious community or tradition. Most Americans believe that their spiritual beliefs and behaviors influence their health.

This was supported by research study written by Farendita, Kirana, Hastuti, and Widyastuti (2020) wherein they mentioned that spiritual intelligence was one of the solutions that offers spiritual calm and can be used to face and solve life problems. It was an intelligence that manifests in ways of behaving and living in a broader context of life. The improvement of a decent otherworldly angle can make somebody more ready to decipher their life and have a degree of self-acknowledgment of their condition in order to give a positive reaction to changes in his well-being. Culture and otherworldliness impact the way that an individual thinks. People who have high profound knowledge have the certainty that they can use the conditions that they experience as a blessing from God. They will take shrewdness from their circumstance. This makes the people with high otherworldliness consistently think emphatically. They attempt to enhance the mending cycle to speed up and support their recuperating. Thus, profound knowledge when thinking will lead people to a superior quality life.

Table I
Inputs to Health Care Strategies and Programs

General Objectives: To develop inputs to health care strategies and programs that improve patients' experiences such as the physical, social, emotional, mental, and spiritual burdens among TB patients

Specific Objectives	Program/Activities	Responsible Person	Expected Outcomes	
1. To strengthen the collaboration between TB patients and their treatment partners	a. All patients with tuberculosis enrolled into DOTS program are required to attend health education provided by a trained individual which consist of the following instructions: A brief review of the disease, including how the disease is contracted and spread; basic principles of treatment; consequences of failure of treatment; and mechanics of the DOTS program including schedule of drug intake, filling up of the daily	TB patient	Regular intake of TB drugs will be ensured and patients will be cured.	
		Barangay Health Workers		
		Public Health Nurses		
2. To promote tolerable activities and adequate nutrition among TB patients				
		a. Prepare and distribute a progressive activity schedule that focuses on increasing activity tolerance and muscle strength	TB patients Public Health Nurse Physician	TB patients will have a better nutritional status and the physical symptoms will be relieved by the various tolerable activities
		b. Prepare and provide a nutritional plan that allows for small, frequent meals and liquid nutritional supplements that will assist in meeting basic caloric requirements.		
3. To increase awareness among the community people regarding tuberculosis and its nature by developing effective and culturally-responsive communication materials				
		a. Conduct health education in the community regarding Tuberculosis to emphasize that the disease is curable.	TB patients Nurses Barangay Health Workers Community People	Community people will be aware that the disease can be treated easily through compliance to the treatment regimen and TB patients will be
		b. Distribute leaflets with information about tuberculosis, its risk factors, its mode of		

	transmission and ways to prevent acquiring of such disease c. Provide continuous health education to all TB patients and encourage family and community participation in TB control.		able to interact with community people without experiencing social stigma.		control. c. TB treatment programs and stringer involvement of local and social networks to support TB patients.		
4.To assist TB patients in coping with the emotional burden and the social stigma brought about by their disease.	a. Formulate a core group consisting of TB patients to promote sharing of experiences and establish a sense of having someone they can relate to. Social support can help patients overcome structural barriers as well as personal barriers, and community and family members' attitudes may affect a patient's decision whether to stop or continue TB treatment. In such circumstances, community-based b. Establish an advocacy group that will promote awareness of tuberculosis by educating the public in its mode of spread and methods of	TB patients Nurses Barangay Health Workers Volunteers	TB patients will gain friends and will meet people who have the same disease wherein they will realize that there are someone who can relate to them and they will not be alone in facing their disease.	5.To assist the patients preventing sadness and boosting their self-esteem.	a. Plan a morale booster program that will emphasize their recovery if they adhere in their treatment regimen. b. TB treatment literacy among those with the disease, their families and communities, through empowering the healthcare provider with knowledge of TB.	Advocacy groups Barangay Health Workers Community People	TB patients will be encouraged and their feeling of depression will diminish that will result in their eagerness to adhere in their treatment regimen and achieve their fast recovery.

VI. Conclusion

Based on the findings, the following conclusions were drawn:

1. Patients who suffer from pulmonary tuberculosis became physically weak because their immune system is compromised.
2. Patients with pulmonary tuberculosis isolate themselves to others as a result of stigma and as a preventive measure in order for their family and friends to be protected against the transmission of tuberculosis.
3. Tuberculosis patients experienced depression due to sudden change in their lifestyle brought about by their condition.
4. Tuberculosis can affect the decision making skills of persons afflicted with the disease.
5. Having afflicted with the disease strengthen their faith in God.

Recommendations

1. The proposed inputs to health care strategies and program may be implemented.
2. The support of local government may be tapped and strengthened in order to help TB patients feel that they are more important member of society.

3. Health care workers may continue educating the community people that they should not limit their activities but instead engage themselves in healthy ones to promote wellness.
4. The local government may allocate more nurses in the community to promote home visit that can increase case finding and reaching them for help in terms of emotional or physical problems regarding their disease.

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iPADALA: An Express Delivery System Using Mobile Platform for Tablas Island, Romblon

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Abstract

Transporting products and packages requires concrete focus to ensure that packages reach its destination safely and to the right recipient. Meanwhile, most of the remote areas including Tablas Island, particularly Zafeway Trading, a general merchandize in Odiongan are experiencing problems in the traditional delivery system. The existing system for delivery of goods and packages has not utilized mobile facilities yet and has not used information and communication technology (ICT) in managing and tracking the transport of products and packages. This system was designed to manage online booking of product for delivery utilizing the mobile phone which can monitor the location of the mover and the estimated time of arrival. This can calculate the total amount of transactions for both movers and customers. The system used Global Positioning System (GPS) and was designed with the aid of Agile Software Development Life Cycle Model. The study was tested acceptable using ISO/IEC 25010:2011 standard.

Keywords

agile software development life cycle, global positioning system, online booking, express delivery system

I. INTRODUCTION

Romblon is an archipelagic province in Region 4B, composed of Mindoro, Marinduque, Romblon and Palawan (MIMAROPA), in the Philippines separated Luzon and Visayas by Sibuyan Sea. (Govph, 2019). Tablas Island is the biggest island in Romblon consists of nine (9) municipalities and the main trade center is Odiongan wherein port is located. This is equipped with infrastructures such as hotels, resorts, food chains, restaurants, hospitals, banks and many others (Vien, M., 2017).

Zafeway Trading is a general merchandise owned and operated by Mr. Zaldy Fetalvero which is located in P. Burgos St. Odiongan, Romblon, Philippines that operates from 8:00am to 6:00pm Monday to Sunday except Saturday. It is one of the biggest grocery store in Odiongan where it caters the daily basic needs of its constituents that offers a wide variety of general merchandise to retailers as well as wholesalers. The business engaged in trading of goods such as consumer products (canned goods, housewares, toiletries, dry goods, food products like locally made delicacies, among others) on a wholesale and retail basis.

Mostly, when a resident acquires for good/s or product/s, delivering of such is being done using “pakisuyo” or “padala”. It is a Filipino word meaning “kindly bring this” or “may I ask you to bring this”. The person who would like to send his item home will talk to someone who will pass nearby in their home area to bring the item. Sometimes, the owner of the item will ask the public utility jeepney driver or the tricycle driver to send to their house if their travel will pass-by in their area. The major problem that could be encountered is most of the time delivery is delayed and usually, there is no tracking of goods to deliver. According to

“Peoplevox, (2016)”, failure to have tracking of the delivery is a big problem since the time and mis-shipment could be encountered. Turban, King, Lee, & Liang (2015) stated that for the success of e-commerce to which clients receive orders, speed contributes major factor. Tablas Island is a remote area, where there is no system of delivery at this moment and transaction is manual. In terms of delivery of groceries/packages and other big items, traditional delivery process is being done as well. Traditional process is being done by asking help or favor to a nearby neighbor seen in the vicinity to bring the items or packages to the owner’s home.

With this, the researcher came up to design an alternative method in conducting delivery of items and packages such as local delicacies like peanut butter and pili nuts, tourists’ packages, documents, groceries and special products like flowers using an express delivery system that is applicable directly to Tablas Island’s present set up specifically in Zafeway Trading. Developing a mobile app that can be used in delivery of items are considered by the researcher as an alternative method in transporting products and packages through online booking system. This is also a courier system but the difference is that the online booking of delivery will be scheduled and transport directly to the customer’s residence. This system will boost the delivery faster than the current method which can provide convenience to the people of Romblon.

II. Review of Related Literature

A. Conceptual Literature

With the development of technology, everything is connected and delivery of goods are already very common. You don’t have to go to a courier office to bring personally the package

you wanted to be delivered to its recipient because right at your fingertips with the utilization of mobile app, you can have your deliveries picked up and delivered to its designated receiver.

The existence of e-commerce in the Philippines, besides the problem related to traffic jams has given way and open opportunities in the courier business. Today even the smallest motorcycle/bike riders participated in delivery services since logistics has broken down into numerous sections. In this regard Lalamove, based in Hongkong that emphasized in logistics service for small scale businesses and individual clients came into the market. Lalamove transforms this particular segment of the logistics industry with the use of advanced technologies like for example GPS vehicle tracking. It has transformed the manner in which transports are completed. Lalamove has eliminated the traditional way of delivering packages by going directly into the companies and individuals in need of their services. This was likely done with the use of mobile application (Cahiles-Magkilat, 2017). iSEND is a delivery system that delivers packages in several parts of Metro Manila and other parts of Rizal Province in which clients or partners are allowed to upload an excel file to consolidate deliveries in each areas. This uses a same day/next day pick-up or delivery of small-items documents with the minimum hour delivery of eight (8) hours usually applied Cash-On-Delivery (COD). GoMoto is another company focused on delivery service using app for booking usually covers Makati, Taguig, QC or Pasig only. Cliqship company is a logistic and door-to-door provider that is specialized in shipping packages in both international and local areas with just 1-cliq system. They offer same-day delivery and next day delivery and usually have an airport-to-airport services. (Sulit, 2018).

B. Research Literature

The development of an express delivery system dedicated to Zafeway Trading in Odiongan, Romblon was framed to provide a convenient and safe delivery of goods and packages to different places.

The strategies to implement a same-day delivery standard for Amazon Prime clients was declared this Spring and just in second quarter this significant logistics venture was said to cost \$800 million. The development of Amazon's center retail deals had been reducing, so speculators trusted that offering millions of additional items readily accessible would get clients to spend more on its site. According to the company's chief financial officer, Brian Olsavsk the outlays for the fast delivery were greater than he had predicted. "Millions more one-day packages went out this quarter than last and customers are responding and they like it" he added (Weise, 2019).

Companies engaged in express delivery services grow faster. The more important thing that companies should consider is the quality of service since it becomes the core competitive advantage in this kind of business. Based on the study in the quality of express delivery, indicators such as safety, character, economy, function, speed and aging are the dimensions that must be considered by the delivery company to obtain customer satisfaction. (Zhou, 2016).

III. METHODOLOGY

The system used both descriptive and developmental method of research. It is descriptive since gathering of data was conducted through series of interviews, surveys and literature reviews. Evaluation of acceptability was conducted through survey by means of a five (5) point Likert scale measuring also the general functionality of the system. This is developmental since system was designed, developed and evaluated to assess its effectiveness. Attributes were taken during the series of tests conducted by the participants composed of systems administrator, customers/suppliers of Zafeway Trading and movers who are the primary users of the system. An adopted questionnaire was used to evaluate the acceptability of the system using the five (5) point Likert Scale.

In evaluating the acceptability of the designed system, The ISO/IEC 25010:2011 standard was used applying the eight (8) characteristics to evaluate this system under this standard, and all sub-characteristics are used in the evaluation of the system. The 8 characteristics that were used were performance efficiency, reliability, security, functional suitability, maintainability, compatibility, portability and usability. In the interpretation of data, the statistical tool that the researcher used was arithmetic mean. Arithmetic mean of a list of the numbers is the sum of all the members of the list divided by the number of items in the list. Number of items refers to the number of respondents who evaluated the system. The purposive sampling was used in the study. Questionnaire was distributed to the movers, customers/suppliers and systems administrators.

The system was developed using Agile Software Development Life Cycle (SDLC). "Every software development organization today seems to practice the agile software development methodology, or a version of it. Or at least they believe they do. Whether you are new to application development or learned about software development decades ago using the waterfall software development methodology, today your work is at least influenced by the agile methodology." (Sacolick, 2018). Building mobile applications can be as easy as opening up the integrated development environment (IDE), combining together everything, conduct a quick bit testing, and submit to the Play Store and all are finished in the afternoon. Or this can apply an extremely involved process that comprises of rough up-front layout, testing the usability, testing the quality assurance (QA) on a lot of devices, creating a full beta lifecycle, and then deploying in different ways. The mobile development life cycle was used in developing the system. The process is composed of a lifecycle which includes the inception, design, develop, stabilize and deploy (Microsoft Xamarin, 2016).

IV. Results and Discussion

The main system was applied using mobile phone that was used by the movers and the customers that use the express delivery system. The main system was deployed using client-server technology. The main system in the server is used by the administrator which is the main operator of the system. The transactions for the day, the registrations of the

movers and customers, the amount of the collected money, the reports and other major information of the system can be managed by the operator or administrator of the system. Drivers of the motorcycle in which system is deployed or integrated are required to register to the system and requirements of the operators must be accomplished before the driver becomes official mover. Each mover will be given an access to use the system through mobile application. The customers(sender) of delivery express service are also required to register before they can use the system.

The software is deployed in the main server. The entire system runs using internet connections. Once the system is installed in the main server, an icon will be displayed in the monitor. Clicking the icon will direct the display to the main menu to where the login of the operator will be asked. Once, the correct password is accepted, the main menu will be displayed. The same with the movers and customers, "iPADALA" installer should be downloaded and installed to their mobile phone. This will produce an icon labeled as "iPadala". Once it is pressed and enabled, a password menu will be displayed to enter the assigned password to both movers and users. The following illustrates the screenshots to show the flow of the system.

Screenshots of iPADALA Android Mobile Application (Mover and Sender)

This part of the system shows the screenshots on how the system works. Figure 1 shows the iPADALA icon. Once the smartphone is turned-on, the iPADALA icon upon installation will be displayed in the screen of the phone. Clicking the icon will display the environment of the app. Menus will be seen to navigate directly with the system. This icon is for the use of the customers to book a delivery.

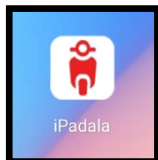


Figure 1: iPADALA App Icon Display

Figure 2 shows the main menu display which provides an option to login as user or mover. Clicking the icon will ask for an account number and password as shown in figure. Once the account id and password are correctly entered, it will directly go to the following display: Login could be a customer login or a mover login.

Figure 3 shows the map to where the items will be delivered. It also shows the total amount of fare to be paid by the sender.



Figure 2: Menu Display

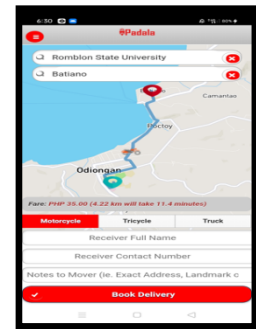


Figure 3: Booking Delivery Display

Figure 4 shows the map while mover is in transit to pick-up location. There is an option that the mover can call the sender or he can click the button "I'm Already Here" to notify the sender that he already arrived at the pick-up point.

On sender side while mover is in transit to pick-up point, a map showing the exact location of the mover as well as the estimated time of arrival can be viewed in mobile app. Also there is an option that the sender can call the mover for additional instructions as shown in Figure 5.

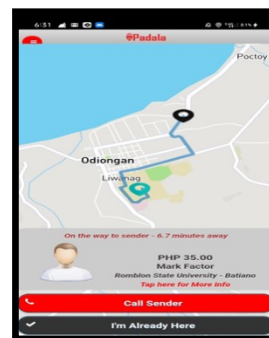


Figure 4: Mover in Transit to Pick-up Point (Mover Screen)

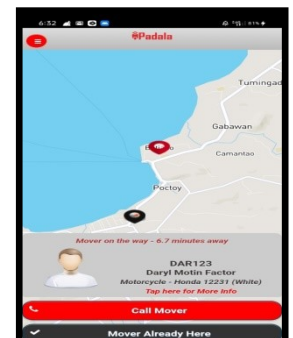


Figure 5: Mover in Transit to Pick-up Point (Sender screen)

If the receiver already encoded the correct delivery code, payment fee will be displayed as shown in Figure 6.

After the transaction was completed, the sender will have to give a rating to the mover from 1 star to 5 star with regards to his overall service performance as shown in Figure 7.



Figure 6: Display Payment Fee



Figure 7: Rate Mover

Screenshots of iPadALA Web Application (Admin)

Upon entering the system using the right login name and password, the system will direct to the admin menu screen display as shown in Figure 8.

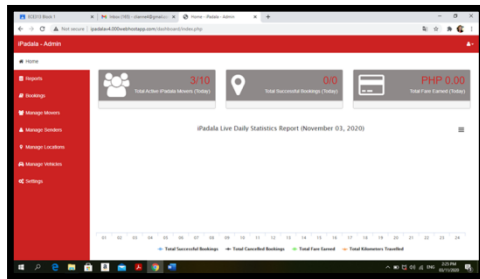


Figure 8: Admin Main Menu Screen

Figure 9 shows the sample details of the customer who requested for bookings. The booking ID was automatically generated and the mover's ID is being searched as per display. The pick-up point is stated together with the delivery point. The status of the booking is also reflected and action option could be clicked to see more details.

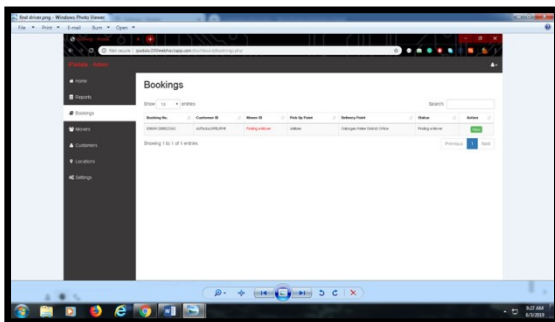


Figure 9: Booking Entry Display

V. Summary

Romblon Island especially in Tablas Island has the manual delivery system of items. They use to ask for help to different people, car or tricycle that may pass by in their area to send or bring their items or packages in their home or other people. With this, the researcher came up in designing a system that

could do express delivery system using mobile phone, GPS and mapbox. The developed system is centralized running in client-server model utilized using mobile phone. The administrator of the system, drivers usually called “movers” and customers also called “senders” are the primary users of the system. Both movers and customers are required to register in the system after downloading the mobile application and installed in their phone. The car or motorcycle of the mover should also be registered to the central office to become part of the iPadala system. The system works by means of booking a delivery service by the customer and wait for the acceptance of the mover. Moreover, on the side of the mover, he waits for a booking and accepts once request is received. When the mover reaches the area of the customer, delivery code will be confirmed. All transactions will be monitored by the use of mapbox and GPS. Upon arrival of the mover, code from the receiver will be verified before item is given. All of the transactions are recorded in the main server and the shares of both movers and owner of iPadala system are transacted in the main system. The system answers the objectives of the mobile express delivery system and resulted to customer satisfactions.

The express delivery system that can facilitate fast and safe transporting of items and packages to desired destination was designed and developed to answer the needs of the Romblon people particularly in deliveries of items or packages to and from Zafeway Trading. The design was easy to use since mobile phone is used applying GPS and mapbox. This design system contributes to the comfortable, safe and accessible ways of delivering products or items. Developing this kind of system led to achieve customer satisfactions to the customers of iPadala in Tablas, Romblon. The system that was developed and designed to manage the records of transactions of both movers and customers which led the researcher to address the needs of Romblon in terms of delivery system. The systems efficiency and accuracy was tested obtaining general weighted average of 4.64, which means that the developed system is “Very Acceptable” to both users and drivers.

VI. Recommendation

The researcher recommends that the designed system should also be used to the different rural areas of the Philippines since most of the areas in other parts of the country also use motorcycle as their primary means of transportation.

This also recommends that the system should be upgraded and enhanced to cater the use of e-payment system like G-Cash and Pay Maya.

Future researchers should enhance the capabilities and functionalities of the designed online booking system such as providing alerts to the drivers when booking is being made and alerts to users if booking is approved. Providing security such as identification if the motorcycle suffered from accident or hijack could be considered to ensure that help could be provided to the mover. Other security features are recommended to be added to make this system better and more improved.

It is also recommended that future researchers should integrate or incorporate reward system such as application of points system that can encourage and motivate to the user to utilize the iPadala app.

VII. Conclusion

This is to conclude that the development of the iPadala Express Delivery System provides great support in the fast and safe transaction of delivery of items and products in Tablas, Island in Romblon, particularly in the municipality of Odiongan. The system provides major contribution to the express delivery system of Romblon by providing fast and accurate sending or delivery of item. This also provides convenience since there is no need to look for anyone anymore who will pass by the sender's area to ask for help as part of current system. Bringing or sending of items can be done through mobile phone which provides convenience and satisfaction to the customers.

The monitoring and tracking of the delivery is one of the good features of the designed system that could boost the trust and confidence of the customers to patronize the system. The major impact is that the application promotes comfortable user experience to satisfy the need of the constituent in Odiongan in terms of sending or transporting products challenged by reviewers if the results are not supported by adequate data and critical details.

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Mangyan Tagabukid Komposo: An Oral Tradition of Sibuyan, Romblon

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Abstract

Oral tradition undergoes a process through the transmission of messages by word of mouth over time. As the messages are passed down, they become oral tradition (Vansina 1985). In this view, music is a part of oral tradition that is already in the minds of the people. Music is socially meaningful because it provides the means by which people recognize identities, places, and boundaries that separate them. It also illustrates some ways in which musical performances provide the means by which ethnicities are constructed and mobilized (Stokes 1997).

The “Mangyan Tagabukid” in Sibuyan Island in Romblon is known for the “komposo” oral tradition. Several functions of music are best seen in several forms that survived through oral transmission and diffusion from other neighboring provinces because of migration. One way of expressing emotions, feelings, and ideas is done through composing “komposo” as it is locally called. This was derived from the Spanish term “composo,” meaning composition. During the Spanish times, it was used as a tool for oral mass communication.

This study is a response to the call for the inclusion of Romblomanons to the musical traditions of the Philippines. It also hopes to articulate Romblon’s cultural identity from its often-overlooked musical traditions. There are existing folk songs or komposo in the province of Romblon but these are neither written nor recorded. Few researches have been made towards this direction

The main purpose of this paper was to gather the surviving komposo from Mangyan Tagabukid of Sibuyan Island in Romblon province. Through textual analysis, the themes of the collected songs were classified according to functions and contexts. The study hoped to contribute to the articulation of the collective cultural identity of the indigenous peoples of Sibuyan Island in terms of their musical tradition. Furthermore, data were gathered through interviews, fieldwork, and immersion. Ethnographic methods were utilized; the researcher became an active participant in the ethnic’s group society, collecting data through participant- observation and taking field notes. Processes such as documentation and analysis of data were considered in terms of text, and context. The collected songs were also classified according to themes.

Based on the given data, “komposo” is one of the music forms that survived through oral transmission and diffusion from other neighboring provinces because of migrations. On textual analysis, “komposo” functions in several contexts and it reveals the consciousness and identity of the province.

INTRODUCTION

Romblon Oral tradition undergoes a process through the transmission of messages by word of mouth over time. As messages are passed down, they become oral tradition (Vansina 1985). In this view, music is a part of oral tradition that is already in minds of the people. Music is socially meaningful because it provides the means by which people recognize identities, places, and boundaries that separate them. It also illustrates some ways in which musical performances provide the means by which ethnicities are constructed and mobilized (Stokes 1997).

The “Mangyan Tagabukid” in Sibuyan Island in Romblon is known for the “komposo” oral tradition. Several functions of music are best seen in several forms that survived through oral transmission and diffusion from other neighboring provinces because of migration. One way of expressing emotions, feelings, and ideas is done through composing “komposo” as it is locally called. This was derived from the Spanish term “composo,” meaning composition.

The “komposo” is one of the most durable forms of literary expression for the Ilonggos. It was also used as a tool for oral

mass communication. During the Spanish colonial period, each barangay or town had an average of two to three “manugkomposos” who would sing in the public places, usually in the plaza during important events to spread the latest “news”. It can be said, therefore, that the “komposo” has always reflected historical and cultural realities and changes through time (Gonzales 1990).

Motivation

Romblon’s geographical location presents a problem to scholars both from the local university in the province and beyond. The three main islands of Romblon, namely: Tablas,

Romblon, and Sibuyan are divided by seas which hinders efficient transportation systems in the province. The same is true to the academic aspect of Romblon’s tradition and culture that remains little studied.

The researcher himself sees the dearth of researches about Sibuyan culture, especially with the Mangyan Tagabukid indigenous group. Most existing academic books in the province investigated Asi and Onhan, but seldom Ini and Sibuyan. Hence, there is a need to explore Sibuyan as a rich ground for cultural researchers and advocates who want to preserve these intangible cultural traits of Romblon.

Objectives of the Study

The main purpose of this paper is to collect, document, and analyze the surviving komposo from Mangyan Tagabukid of Sibuyan Island in Romblon province. The Komposos were analyzed textually in terms of syllabication, figurative language, and theme. On the other hand, musical analysis of the komposo were analyzed using the Western formula. The study hopes to contribute to the articulation of the collective cultural identity of the indigenous peoples of Sibuyan Island in terms of their musical tradition.

Statement of Contribution

This study is a response to the call for the inclusion of Romblomanons to the musical traditions of the Philippines. There are existing folk songs or komposo in the province of Romblon but these are neither written nor recorded. Few researches have been made towards this direction. The songs of Sibuyan, specifically those of “Mangyan Tagabukid” could possibly bridge the historical gaps chronicled in the province’s cultures and traditions. Moreover, these songs are linked with the consciousness of the people, thus providing valuable information that would contribute to discourses in regional and national identity. Likewise, the study hopes to articulate Romblon’s cultural identity from its often-overlooked musical traditions.

Methodology

The study required extensive collection. Data was gathered through interviews, fieldwork, and immersion. Ethnographic methods were utilized: the researcher followed Participant Observation in the ethnic’s group society, taking field notes, and field diary. Manuel’s (1982) depth of horizontal test was used to identify the informants. The informants were composed of 8 people, with age ranging from 23-82 years old, and with average residence of 20 years in the locality. They use *Ini* as primary language but can also use other languages such as Hiligaynon and English. Semi-structured interviews were done to gather data but also allowed additional information as deemed necessary by the researcher. Then, processes such as documentation and analysis of data were considered in terms of text and music. To ensure that the *komposo* were representative of the localities from which they were gathered, the researcher validated the *komposo* to five validators from the locale.

The 8 komposo were analyzed in terms of text. The existing figures of speech were identified line by line, quatrain by quatrain, song by song. In analyzing the text, Formalist literary theory was used. This allowed the researcher to fully understand the texts and their meanings and its relationship with the Mangyan Tagabukid group. Then, the komposo were musically analyzed according to key signature, range, leaps, contour, rhythm, harmony, cadence, and form.

Results and Discussion

“*Nang Sadio Pa Anay Si Diling Ga Eskwela*” pictures the image of “Diling,” an epitome of hard work, obedience, respect and injustice as reflected in her character from the song. Just like any other story of having an ill-tempered and disciplinarian father, growing up with her elder brother was not easy for they need to abide by the rules set by the head of

the family. She was deprived of self- happiness due to her father who meddled in her plan of getting married with the man of her dreams.

This komposo speaks a lot of a traditional type of parenting where the father, in particular, imposed strict adherence to house rules and any disobedience on the part of the children is tantamount to a grave or fatal discipline just like what happened to Diling. It portrays the strong religious belief of Christians in view of death in that peace and forgiveness of sins will be achieved through the use of the holy water sprinkled on Diling’s coffin while in the church. Lastly, this komposo is an example of tragedy where the main character, “Diling” died and was given a pitiful burial represented by the unequal number of tombs which is eight and casket which is five.

The theme of the song is love, courtship, and marriage. The line “*Nagaturo agay ang dugo sang likod.*” shows hyperbole. The meter count of the song is Gansal having 13 syllables per line in the first quatrain and Pares having 12 syllables in the next four quatrains.

“*Akong Komposohon Sakayan Nga Kuyon*” employed a quatrain stanza break in that visual groupings of lines consists of four. This komposo showcases the inventive persona of the composer by being resourceful by way of converting pieces of scrap into something worth using and memorable. The manner of conversion exemplifies the ordinary trait of a rural boy who loves to play and relates his dream to the kind of toy he uses for playing. Words like *kuyon* and *papaya*, associated with the word “*sakayan*” or “*vehicle*,” are figuratively used by the author in such a way that “*kuyon*” literally means pot, an old and commonly used material for cooking while “*paya*” stands for a coconut shell. The existence of metaphor also adds color to the meaning of the toy boat like, “*Sakayan nga kuyon*” and “*Sakayan nga paya.*” In the lines where the two symbols are significantly used, both represent the dreams or ambitions of an ordinary child when he grows up. Though, the said symbols are quite distinct in certain aspect in that *kuyon* has a rounded figure while *papaya* is elongated. In a greater sense, considering the shapes of the toy boat reaching for one’s dream takes so much courage and determination knowing that it will take a young boy year before he will be able to reach his desired destinations in relation to the toy boat’s movement and pacing. On the other hand, Romblon and Manila refer to the literal places that each toy boat wants to reach. But figuratively speaking, it shows how far one wants to go and how he has a simpler dream than the other.

The theme of the song is Folk life. Extended metaphor is present in the line “*Sakayan nga kuyon / Sakayan nga paya*”, Hyperbole is present in the “*Sa tunga sang lawod / Naga loy lipuyon*”. “*Suminggit ang rayet*”. The song is in Pares meter count having 12 syllables in each quatrain.

“*Akon Komposohon Si Kumpadre Duro*” is in a quatrain form and can be considered as a humorous komposo. It tells about a story of a closest friend of the author who loves going to the coast. However, while on his way to the shore one day, he got in a serious accident when he got bored in the pit damaging his private part. Also, such an experience bears

witness to being carefree in life at certain point and not minding what happens next. Though, it sounds lively and has an amusing effect on the ears of the listeners especially those who have a good grasp of the language, it also teaches a person to be cautious about certain things and actions and not to take them in a rush in order to be safe.

The theme of the song is folk life. Hyperbole is present in the line “Naluslos ang panit pakadto sa puno”. The meter count of the song is Pares with 12 syllables in each quatrain.

“*Ang Sulat*” is an example of a three- stanza quatrain following end rhyme in the original version. The first couplet expresses a feeling of surprise upon knowing that the young lady’s heart is torn between two lovers. The letter as the main symbol used in the title of this komposo keeps the overwhelming love that one feels for a special someone. Thus, a love that is taken for granted feels great loneliness and hopelessness. The second couplet verbalizes the pain that kills the whole being of a lover. That a forsaken love means dying on the part of a true lover whose wholehearted service for his dearly beloved is all in vain. The third couplet gives in to the feeling of desperation and vanishing in this world due to a heart break. It can be said from the lines that the persona is already madly crazy in love that he no longer sees any hope of starting over again. To him, losing the love of his life means dying for life has no more meaning when the one you truly love will not be yours in the end. As a whole, this komposo highlights the power of metonymy like in the line, “Tagipuson nga walay kalipay” by relating a lover’s heart to unhappiness due to an unfaithful love, a love that is and will never be meant for the both of them.

Love, Courtship, and Marriage are the theme of the song. The lines “*Tagipusoon nga walay kalipay.*” shows Metonymy. The song is in free verse form.

“*Ang Baro Kong Gisi*” is an example of a three- stanza quatrain. It portrays a humble kind of living and the true face of poverty in the life of a native. The first couplet purely reveals the happy mood yet touching experience of the persona of having just a ripped cloth washed with love of a mother and worn with excitement by a child. Though, sometimes still misty will not stop the child to attend school. The second couplet narrates a pitiful scenario in school where a poor child suffers from hunger and lovelessness for a fact that even during break time, she still endures the pain of a starving stomach and feels weak because all she can do is stare at those with food to eat while going through a stage of emptiness. The third couplet divulges the very reason of survival of the child’s poor family relying only on root crops to face another day while savoring the taste of rice for food only during harvest time.

The song talks about poverty. Hyperbole is present in the entire second and third quatrains. The song has 12 syllables in each line and is in Pares form.

“*Akon Ikomposo Isla ng Sibuyan*” is a quatrain by stanza break. The first couplet takes pride of the richness of Sibuyan Island in terms of natural wealth as mentioned by their ancestors. The word kanto or borders symbolically refers to the locations where treasures of the island reside. The second

couplet talks about the enduring character of the Anthrowats believed to be adventurous people who love to travel places. The third couplet exalts the generosity of the KKP (World Wildlife Fund) which greatly contributed to showing the love, care and conservaton of the endangered species and even reached out to the poor residents of the place. The third couplet upholds the human rights of the indigenous people through the legal counsel. There exists a meaningful effort done by the members of the Panlipi of enlightening the natives’ minds to build a strong support for family relationship with the inculcation of unity in every family member. The last couplet challenges the listeners to take action now, more than ever, to do the necessary change for the betterment of the future generation. For instance, the words nalooy or pity and kahapo or exhausting mean a call to action for the adults to turn away from their corrupt ways to help save the generation of youths to come and allow them experience the refreshing life that today’s generation of people enjoys for free and with great comfort. Generally, this komposo uses Sibuyan Island as a symbol of home worthy enough to be preserved and conserved for forthcoming generation.

The theme of the song is love of Sibuyan. There is Anaphora (repetition of lines) and apostrophe (talking to the inanimate) used in the last line of the komposo “*Abaw nga kahapo! Abaw nga kahapo!*” The meter count of the song is Pares having 12 syllables.

“*Ang Sadto Pa Anay*” is a stanza komposo with end rhyme that is filled with reminiscing. Though, the persona’s tone of voice is gloomy knowing that it’s a lost love he has now. Also, there is a certain feeling of disdain reflected in the phrase “*mabagsak ako*” in the last line which is a truism in a starting love relationship that all goodness is shown and expressed. However, as days go by and as a lover’s heart grows weary of the demand to sustain affection, especially on the part of a man, true love also fades away. Words like habul (blanket) taken from habulan and balhas (sweat) symbolically bear witness to care and patience of a man to provide comfort and satisfaction for someone special to him. Yet this love is intensely crazy because if one loses the will to carry on fighting for this love, life then, has no meaning. It means that love can make or unmake a lover’s dream of being genuinely happy. Although, it’s full of suffering if one deserts a partner so quickly and easily.

Love, Courtship, and Marriage are the themes of the komposo. Apostrophe is used on the line “*Abaw man si Nonoy daw walay kaluoy*” and situational irony is used in the line “*Kamatayon ngani ang akon pangita*”. The song has 12 syllables and in Pares form.

“*Sa Higad Sini Nga Bukid*” plays around two couplets with emphasis on the fun experience of the author as a drifter. Just like a mere observer, the narrator directly describes the existing condition of a place having a fountain which is normally seen in the province particularly in the mountain. Also, it’s a real experience of a wanderer that when he feels thirsty from a long trip up the mountain and when he sees a flowing water he would quickly long for the comfort of it to

quench his thirst which in this case, is answered by the clear water from a fountain.

The theme of the song is folk life. There is Hyperbole present in the line “*Kag didto ko guin batyag / Ang katin-aw sang tubig*”. The meter count of the song is eight and seven syllables. It is in Pares and Gansal form.

Summary of Textual Analysis

The textual analysis of the komposo revealed how rich the oral tradition of Romblon. Coroza (2008) noted that syllabication of Filipino poetry. All eight komposo were found to heavily used Pares form. Pares is a meter count using even syllables, which in this study were 12 syllables. Among the komposo that followed Pares form are Akong Komposohon Sakayan Nga Kuyon, Akon Komposohon si Kumpare Duro, Ang Baro Kong Gisi, Akon Ikomposo Isla ng Sibuyan, and Ang Sadto Pa Anay. Meanwhile, two komposo used Gansal form: Sa Higad Sini Nga Bukid (seven syllables) and Nang Sadto Pa Anay Si Diling Ga Eskwela (13 syllables).

In terms of figurative language, the komposo primarily used hyperbole in its lines. Five komposo used hyperbole: “Nagaturo agay ang dugo sang likod”, “Sa tunga sang lawod / Naga loy lipuyon”, “Naluslos ang panit pakadto sa puno”, and “Kag didto ko guin batyag / Ang katin-aw sang tubig.”

The komposo’s themes can be divided into four: love, courtship, and marriage; folk life; poverty; and love of Sibuyan. These imply that most topics of komposos sung in Sibuyan talk about their daily life, their relationships, and Sibuyan itself. The use of figurative language in poetry is a must. This is something that helps define poetry as a literary genre. Figurative language, according to Giroux (1974) uses words in a non-traditional way. It produces a unique impression, clarifies a concept, and makes writing increasingly vivid and powerful.

Musical Analysis

The song entitled “Nang Sadto Pa Anay Si Diling Ga Eskwela” is on Key of D Minor. Its range is from E4 to G5. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced with repetitive melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. Primary chords were mostly used. These are the tonic, subdominant, dominant. Authentic cadence (Dominant to Tonic) is also observed in the piece. It is a one-part song form or strophic form.

The piece entitled “Akon Komposohon Sakayan Nga Kuyon” is on the Key of G Minor. Its range is from G3 to A4. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced. We can also see repetitive melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. Primary chords are mostly used, the tonic, subdominant, dominant. It uses the Authentic cadence (Dominant to Tonic). In terms of form, it belongs to strophic or one-part song form.

The song “Akon Komposohon Si Kumpare Duro” is on the Key of G Sharp Minor which ranges from G Sharp3 to B4.

Basically, the melody mostly moves in wide leaps. We can observe occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. Primary chords are mostly used, the tonic, subdominant, dominant. Authentic cadence (Dominant to Tonic) is also observed in this piece. In terms of form, it goes to strophic or one-part song form.

The song entitled “Ang Sulat” is on the Key of C-Sharp Minor. It ranges from C Sharp4 to E5. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. In terms of contour, the shape of the lines is very symmetrical and balanced. We can also observe a repetitive melodic pattern throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. Primary chords are mostly used, the tonic, subdominant, dominant. In terms of cadence, it uses the Authentic one (Dominant to Tonic). Strophic or one-part song form is evident in this song.

The song “Ang Baro Kong Gisi” is on the Key of C-Sharp Minor. It ranges from C Sharp4 to E5. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. In terms of harmony, primary chords are mostly used, these are the tonic, subdominant, dominant. Authentic cadence (Dominant to Tonic) is also used in the piece. A strophic or one-part song is obvious in this piece.

The song entitled “Akon Ikomposo Isla ng Sibuyan is on the Key of C Sharp Minor. Its range if from C Sharp4 to E5. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. In terms of contour, the shape of the lines is very symmetrical and balanced. We can also see repetitive melodic patterns all throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and mutation of this. Primary chords were mostly used, the tonic, subdominant, dominant. Authentic cadence (Dominant to Tonic) is observed in the song. This piece also belongs to strophic or one- part song.

The song entitled “Ang Sadto Pa Anay Palangga Mo Ako” uses the Key of G Minor. It ranges from G3 to A4 (low range). In terms of leaps, the melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, some variations and changes of this. In terms of harmony, primary chords are mostly used, the tonic, subdominant, dominant. It also uses the Authentic cadence (Dominant to Tonic). Still, the strophic or one-part song form is used.

“Sa Higad Sini Nga Bukid” belongs to Key of G-Sharp Minor. It ranges from C-Sharp4 to D-Sharp5. The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found. The shape of the lines is very symmetrical and balanced. We can see repetitive

melodic patterns throughout the song. This rhythm is distinct on most lines on this komposo. There are however, variations and alterations of this. Primary chords were mostly used, tonic, subdominant, dominant. Authentic cadence (Dominant to Tonic) is also observed in this piece. As usual, strophic or one-part song form is evident in the song.

All of the songs are in the minor keys. They also share the same tune or motif. Their melodies mostly move in wide leaps. The shape of the lines that are present in the songs are very symmetrical and balanced. We can see repetitive melodic patterns throughout the eight (8) songs. Majority of the rhythm of the songs are in the same time signature. In terms of harmony, primary chords are used. These are tonic, subdominant, dominant. Authentic cadence and strophic form are the cadence and form of the songs. Basically, the seven (7) songs namely: Nang Sadto Pa Anay si Diling Ga Eskwela, Akong Komposohon Sakayan Nga Kuyon, Akon Komposohon si Kumpare Duro, Ang Sulat, Ang Baro kong Gisi, Akon Ikomposo Isla ng Sibuyan, Ang Sadto Pa Anay, and Sa Higad Sini Nga Bukid belong to one tune family.

According to Bayard (1950), experiences and observations in British-American folk songs achieves resemblances or similarities in terms of tune of the songs. Based from those observations and experiences, he found out that each of the individual tunes was derived from a principal tune. For him, there are melodies that belong to one tune family. He defined a tune family as a group of melodies showing basic interrelation by means of constant melodic correspondence, and presumably owing their mutual likeness to descent from a single air that has assumed multiple forms through processes of variation, imitation, and assimilation.

Summary and Conclusions

As a vocal genre adopted from Hiligaynon and Kinaray-a speaking regions of Aklan and Panay, the creativity and poetic mastery of the Sibuyanons are evident in their musical compositions.

Music plays a significant part in the Mangyan Tagabukid culture and tradition. In the collective consciousness manifested in the music of their komposo, their beliefs, feelings, emotions, ideas, and attitudes are expressed. Poetic inclinations of the people are also manifested in their komposos. It was noted that songs use metaphoric devices from their environment. Figurative languages such as metaphor, anaphora, apostrophe, metonymy are present in the *komposo* which shows the richness of Sibuyan oral traditions.

Romblon as a unique archipelago with its history, cultural, and ethnolinguistic differences produce variations on the themes, and topics of the songs. The language that was utilized in the Sibuyan komposo was primarily borrowed from Hiligaynon and Kinaray-a speaking regions. The Mangyan Tagabukid people sing love songs for courtship and marriage, folk life, poverty, love of sibuyan and humorous songs as reflected in their various komposos. Songs are composed out with adeptness and creativity. They express love, joy, sorrow, disappointment, and discipline experienced throughout their lives and constructed by a society that shapes their values and attitudes- reflective of the community's culture.


Future researchers in Romblon should also identify and collect some of the existing musical traditions in other islands. They may also study the origin and history of each song so that people in the province of Romblon will be aware of their ethnic affinities. Furthermore, intensive analysis of musical performance, variants and versions of tunes and interrelationship of texts and tunes shall be studied.

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Title of Songs	Key Signatures	Range	Leaps	Contour	Rhythm	Harmony	Cadence	Form
Nang Sadto Pa Anay si Diling Ga Eskwela	D Minor	E4 to G5	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Akong Komposhon on Sakayan Nga Kuyon	G Minor	G3 to A4	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Akon Komposhon si Kumpare Duro	G-Sharp Minor	G-Sharp 3 to B4	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Ang Sulat	C-Sharp Minor	C-Sharp 4 to E5	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Ang Barokong Gisi	C-Sharp Minor	C-Sharp 4 to E5	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Akon Ikomposon Isla ng Sibuyan	C-Sharp Minor	C-Sharp 4 to E5	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)
Ang Sadto Pa Anay	G Minor	G3 to A4 (low range)	The melody mostly moves in wide leaps. Occasional stepwise and stationary motion can also be found.	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant, dominant.	Authentic cadence (Dominant to Tonic)	Strophic (One-part song form)

Sa Higad Sini Nga Bukid	G-Sharp Minor	C-Sharp 4 to D-Sharp 5	C-Sharp4 to D-Sharp5	The shape of the lines is very symmetrical and balanced. We can see repetitive melodic patterns throughout the song.		Primary chords were mostly used, tonic, subdominant , dominant.	Authenti c cadence (Domina nt to Tonic)	Strophic (One-part song form)
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Mental Toughness and Character Building through Sports

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Abstract

This study was conducted to identify the level of application on mental toughness and character building of athletes and coaches in Pampanga along with the socio-demographic profile of the respondents. The degree of effect of mental toughness and character building was determined and whether there exists a correlation between mental toughness and character building.

The results revealed that the level of application on mental toughness and character-building did not differ among athletes and coaches. Also, along with the socio-biographic profile of the respondents, the level of application on mental toughness and character-building did not differ significantly along with gender, type of sports participated, and several years of coaching. However, along with respondents' age, the level of application on mental toughness and character-building differed significantly with the highest level of application on the older age group of respondents to which the coaches belong.

On the degree of effect, the athletes and coaches had an agreement along with the qualities/traits on mental toughness and along with character building. The degree of effects ranged from high to very high effect. Lastly, the correlation between mental toughness and character building of the respondents was moderate and it was also significant.

Keywords

Mental Toughness, Character Building, and Sports.

I. INTRODUCTION

A. Background

A people's achievement could be traced back to their personal characteristics. A pessimist never had won, a negative thinker has not succeeded, and a dysfunctional person has never attained his or her aim in history. More about a person's personality and destiny cannot be predicted unless their mind is altered. They have their concentration, control, and direction on what they have done, based on the lessons gained from great people. That is why they succeed, as Edison (1868) put it, "genius is one percent inspiration and ninety-nine percent perspiration." It is comparable to the mindset of a person who is aware of his or her own abilities; they can forecast their own success or failure. The quotes backed up one of the ideas.

One of the concepts was supported by Jefferson's (1826) statement, which stated that "nothing can stop a person with the right mental attitude from achieving his goal; nothing on earth can help a person with the wrong mental attitude." Most successful people began with their vision and chose to pursue it. Numerous among these fell in many situations, but their failures were the spark to their challenges. "Failure is an opportunity to begin again more intelligently," Ford (1947) remarked.

Coaches and athletes alike are striving to improve their performance. Typically, the search has led to the formation of physical or technical training programs. Coaches and athletes are more conscious of the importance of cognitive skills in

sports and are emphasizing their development. Jones, et al (2002), suggest that improving mental skills is essential not only for those who want to win but also for those who want to become more consistent performers.

Furthermore, mental toughness continuously emerged as one of the most essential psychological aspects of sport among the mental skills. Mental toughness is widely demonstrated in the literature to be essential for optimal athletic performance. Mental toughness can also be measured by coaches and players. Character development is important in sports training as well. "The key to having a positive attitude is the intelligence to change," according to a quotation from Maxwell (2014). They are either master of their attitudes or slaves of them. It is entirely a matter of personal preference. Are they who they are because of the decisions they made yesterday? They will become tomorrow what they chose now. To change entails making a conscious decision to do so."

Similarly, the Josephine Institute Center of Sports Ethics discovered many athletes that demonstrate moral reasoning. Many additional researchers have identified a detrimental association between sports activity and character development in this situation (Dunn & Dunn, 1999; Beller & Stoll, 1995; Bredemeier, 1995; Hahm, 1989). Hellison (2003) also discovered that sports participation does not automatically result in positive character development. In a study by Hahm (1989), 400 college students from America and Korea were tested on their moral reasoning and moral behavior using the HBVCI and the Defining Issues Test (Rest, 1979). The results revealed that physical education majors and student-athletes scored lower on moral reasoning

and moral judgments than the general students. Athletes were discovered to be breaking the rules during games and acting aggressively towards opponents, which was regarded as a lack of character (Dunn & Dunn, 1999; Silver, 1983). What happened to the connotations of "sports build character" and the tactics for character development through sports participation?

Sports engagement does not develop character, discipline, self-esteem, or other achievement-related attributes in young men and women, according to Kirk (2005). Instead, it gives individuals who already possess these excellent characteristics a place to express themselves.

B. Motivation

The higher the level of application on student-athletes and coaches' mental toughness, the more favorable the character development and lifelong learning, and the bigger the results. However, the socio-biographic status of the student-athletes and coaches, such as age, gender, sports event participation, and years of playing, has an impact on the presumption of a link between mental toughness and character formation and lifetime learning.

Furthermore, a student-lifelong athlete's learning of playing for many years should be reflected in their life undertaking. The athletics program should be run in such a way that it promotes the athletes' psychological, social, and moral development. The program should teach kids skills that will enable them to be productive citizens and responsible individuals. The integrity and sociability of the sports program should be maintained by the higher authorities. Furthermore, the program should not jeopardize character development, which will secure the participants' intellectual, physical, emotional, and moral well-being. The value of character, ethics, and sportsmanship should be regularly pushed by sports media in expert talks so that people would always look forward to feeling the importance of moral thinking in life.

The researchers being an advocate of holistic development in the field of kinesiology would like to investigate the deeper impact of the athletic participation of student-athletes in the collegiate level of sports if it has a direct impact on the lives of practitioners. Especially that piracy and cheating were observed in the conduct of tournaments in the regional level of competition. Having the cases of cheating violates the true essence of sports involvement. Participation in sports can reveal a person's positive and bad personality qualities. Sports events can shape people's conceptions of what character is all about, and they can contrast virtuous and no virtuous actions.

C. Objectives

Responses are based on concept application, and responsibility becomes real as the agency reacts in real life. Sports involvement is encouraged because it reflects real-life situations in which mental health is involved. Sport also provides a sense of ethos and context.

The study sought to investigate the following: 1. The level of application of mental toughness and character-building in the training program by student-athletes and coaches, 2. Apart from age, gender, sports participation, and years of playing and coaching is the difference in the level of application of mental toughness and character-building,

3. Also is to find the effect of the mental toughness and character-building techniques used by coaches and student-athletes have on the development of character traits, and 4. To establish the relationship between the amount of mental toughness and character development and student-athletes lifelong learning.

II. Methods

This chapter discusses the research design, population, locale of the study, data collection procedure, and treatment of the data.

D. Research Design

The research approach used in this study was a combination of descriptive and correlational methodologies. A structured questionnaire was established for data collection based on past study suggestions in mental toughness and character building that a sports program should go through or operate.

E. Population and Locale of the Study

The research was carried out in Pampanga's higher educational institutions that are actively involved in organized collegiate competitions such as the State Colleges and Universities Athletic Association (SCUAA), the Private Schools Athletic Association (PRISAA), and the United Central Luzon Athletic Association (UCLAA). In the province, 10 higher educational institutions were identified as active participants. Both public and private institutions were considered to make the study more valid and dependable in terms of its findings.

F. Data Collection Instrument

The researchers used a custom-made questionnaire based on the findings of mental toughness and character development studies. Sports coaches, sports psychologists, and super-elite athletes all verified the questionnaires (athletes who won Olympic medals, and world championships). And some of the many sports programs in collegiate and professional leagues have incorporated the traits that were described in mental toughness and character building. The elements were drawn from Jones, et al., and Ripkin's work; Fullinwider's work; Clough, et al., Crust, and Ghasemi, et al. work's; Mango: Heart of Illinois Conference; and Yukelson's work.

G. Data Gathering Procedure

The researcher submitted a letter to the school president and/or vice president for academic affairs, via their sports director, requesting assistance in conducting and gathering data for the study's completion. Following clearance, a meeting with their athletic director was held to discuss the various timetable options for the student-athletes. Because of the time constraints that the researcher and responders are experiencing as the final test approaches, a single timetable was sought for the pre-conference system that was taught per group in a school.

H. Treatment of Data

Using the appropriate statistical technique, the data was gathered, processed, and interpreted. The T-test was used to compare the two means and see if there was a significant difference in the mean score of male and female athletes in terms of mental toughness and character-building; the level of application of mental toughness and character-building to athletes and coaches; the level of application along with

sports; the level of application along with gender; and the degree of effect on mental toughness and character-building. The f-test was used to analyze the three variables on the application of mental toughness in relation to respondents' age, years of coaching, and character-building in relation to years of coaching during the process.

III. RESULTS, DISCUSSIONS, AND CONCLUSIONS

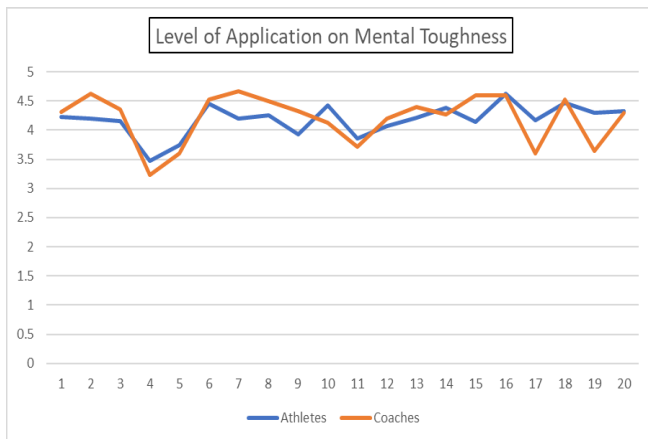
I. Results

1. Application on Mental Toughness and Character-Building

1.1 Level of Application on Mental Toughness

The level of application of mental toughness and character-building among the coaches and student-athletes shows the findings, with levels of application ranging from somewhat applied to entirely applied. This study includes 20 components that assess mental toughness, one of which is rated as fully implemented by both coaches and athletes, with an average of 4.62 and 4.60, respectively. Having a love for what you do is the variable. This indicates that both coaches and athletes understand the meaning and importance of sports enthusiasm. Winnix (2010) found that "having a passion for what you do" and "having internalized incentives to succeed" were the most crucial aspects of mental toughness when it came to Karate.

Table 1. Level of Application of Mental Toughness



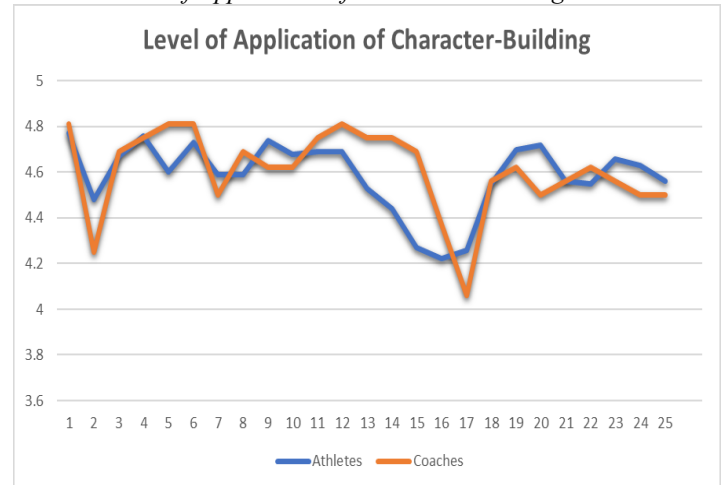
1.2 Level of Application on Character-Building

Character development is another application examined in this study. As expected, sports have improved the athletes' character with the assistance of coaches. Table 2 shows the findings of the coaches' level of application in the character-building of players in Pampanga. It demonstrates that, on average, the athletes' degree of application is complete. It's the same with the coaches' assertion and or viewpoint. The least used component or the component with the lowest grade among the 25 components on character building application is engaging in hegemonic opposition (4.22) for athletes and the feeling of empathy (4.06) for coaches. In addition, the highest or most common character among athletes used during the training program is cooperating with teammates (4.77), and the most common character among coaches is cooperating with teammates

(4.81); develop self-discipline and practice self-control (4.81); respect rules (4.81); and aggressiveness (4.81). Athletes and coaches have different levels of application. Table 2 shows the results. As may be deduced from the data, there are no significant outcomes for any of the components. This means that, on average, athletes and coaches believe that the level of application on the development of various character qualities throughout training programs is similar. The athletes and coaches both claim that the level of application on a given component is modest. As expected, sports have improved the athletes' character with the assistance of coaches. Table 2 shows the findings of the coaches' level of application in the character-building of players in Pampanga. It demonstrates that, on average, the athletes' degree of application is complete. It's the same with the coaches' assertion and or viewpoint. The least used component or the component with the lowest grade among the 25 components on character building application is engaging in hegemonic opposition (4.22) for athletes and the feeling of empathy (4.06) for coaches.

Omar-Fauzee et al. (2012) backed up the findings of the study, stating that the self-confident component consisted of self-discipline and knowledge, with self-confidence accounting for 13.7 percent of mental toughness among football players. Furthermore, discipline and knowledge are important components of self-confidence for the respondent.

Table 2. Level of Application of Character Building



2. Comparison on the Level of Application of Character Building Along with Socio-Demographic Profile of the Respondents

Table 3 shows the level of applications on character formation, as well as the respondent's age. The total mean across age groups differs greatly, as shown in the table. The tale of application on character-building for respondents aged 16-18 is equal to 4.19 (moderately applied), which is nearly identical to the result for respondents aged 18-19, who had a mean of 4.33. (moderately applied). The difference, however, is found among responders aged 22 and up, who had a mean rating of 4.55. (fully applied). Display courage; develop self-discipline and practice self-control; aggressive; subordinate self to group/team; grasp ethics; respect the

environment and develop perspective-taking are all components with substantial effects across age groups. Other favorable effects of sports engagement were inversely connected with school dropout and delinquent behavior, according to McMillan & Reed (1994) and Shields & Bredemeier (1995) studies. Furthermore, Evan and Roberts (1987); Larson (2000); and Wright and Cote (2003) supported the study's findings that student-athletes who are exposed to sports develop an interest in sports and have the desired effect of their participation, such as peer relationships, courage, respect for rules, competitiveness, and citizenship. Character-building and these elements are applied at the same level by respondents aged 16 to 18 and 19 to 21, with averages ranging from modest to fully applied. This means that if the 16- to 18-year-old respondents' ratings are fully applied, the same rating will be seen for those aged 19 to 21. While the average level of application along these components is all entirely applied among respondents aged 22 and up, the overall observation is that the average level of application along these components is all fully applied among respondents aged 22 and up. This means that sports require progression and development, and it was discovered that sports build character based on the computed f-test, which describes moderate to fully applied character building on the process as student-athletes progress in competitive activities. Based on the researcher's coaching practice, when he coaches, he focuses on improving the holistic character of student-athletes; as a result, his coached student-athletes have positively praised what they have learned during their time as varsity players at the school.

Table 3. Comparison of the Application of Character Building Along with the Socio-Demographic Profile of the Respondents

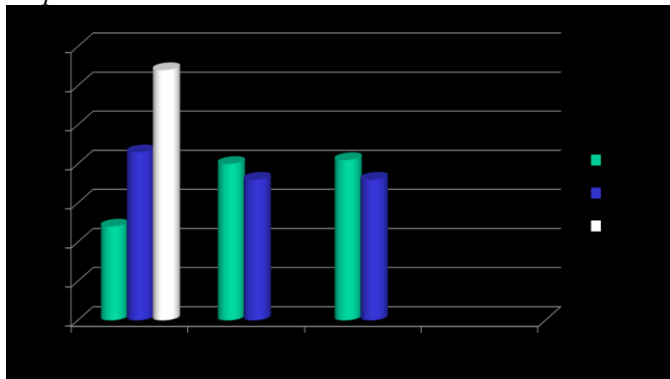


Table 3 reveals that, on average, male and female respondents do not differ considerably in terms of character-building application since they are not fully applied. The overall averages of 4.60 and 4.55, respectively, imply that male respondents have a higher level of application than female respondents. In line with this, there are two character-building components where both male and female respondents show substantial results. Developing self-discipline and submitting self to a group/team are two of these components. As cited by Fullinwider, Redings backs up these findings (2006), "To be good, an athlete must continue, discipline herself to the rigors of training, and

gather the courage to keep going even when her cause appears hopeless," she says. All of this is true whether the athlete is competing in track and field, tennis, or soccer. The athlete's situation in the last scenario necessitates more than perseverance, discipline, and bravery. Soccer is a game of positions and roles, and a team cannot succeed unless each player submits to the demands of the game and fulfills her tasks. In other words, being selfless is a character trait that should be completely developed in a player.

Similarly, male athletes regarded team loyalty as a normal character-building component, while displaying courage was ranked last, with a mean of 4.78 and 4.15, respectively. In the female group, displaying sportsmanship is the most prevalent component, whereas engaging in hegemonic opposition and feeling empathy are the least common components of character development. Because of his loyalty, UCLA's Coach John Wooden has the most wins in the NCAA Basketball Men's Division (superb cooperation to teammates and coach). UCLA's players were fiercely dedicated to their coach as well as their teammates.

3. Degree of Effect of the Mental Toughness and Character Building Employed by the Respondents

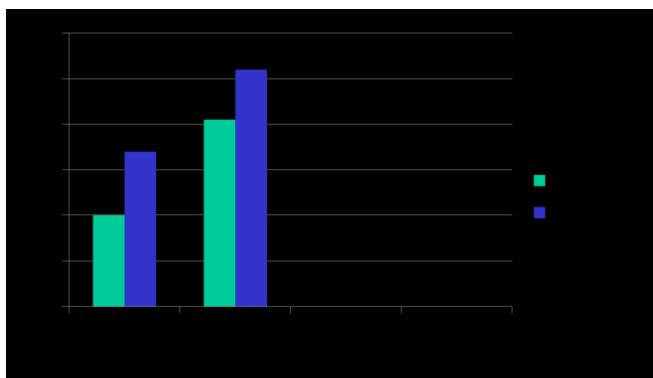
The athletes claim a high level of growth, as shown in the table, with averages ranging from 4.20 to 4.39. The overall magnitude of the effect is likewise quite strong. Being persistent and refusing to submit receives the lowest grade, implying that this component is not considered as a factor in mental toughness during the training program. With a mean of 4.34, the highest-rated qualities/traits include resisting pressure and having great cognitive skills. This suggests that when coaches use mental toughness in training, players might develop these attributes.

To back up this claim, Loehr (1986) said that 50% of sports success is related to psychological factors affecting mental power among athletes and coaches. In addition, Gould et al. (1987) found that coaches believe that mental toughness contributes to team performance in other studies on mental toughness. In their study, Gould et al. (2002) discovered that champion and high-performance athletes in the Olympic games admit that mental toughness elements play a role in their success.

Coaches also noticed a difference in the athletes' mental toughness when they used or incorporated mental toughness into their training routines. Table 3 measures and displays the perception. The coaches' declaration is more credible than the athletes' assertion. Specifically, rebounding from setbacks and failures, which coaches perceive to have a high effect, means that the influence on the athletes is significant, whereas it is only deemed high on the athletes if the concept is exceptional. The coaches also said that a commitment or strong involvement in the activity at hand is the least considered consequence of mental toughness. The overall degree of mental toughness effect as claimed by coaches to the athletes is significant, with a mean of 4.44. Positive validation of the coaches' claims demonstrates maturity on their side, as lessons learned from retreats and mistakes typically reflect an opportunity to develop, mature, and reflect. Michael Jordan stated this claim in 1996, saying, "I

missed 9000 shots, 26 game-winning shots, and lost 300 games, I failed over and over, that is why I succeed."

Table 4. Effect of the Mental Toughness and Character Building of the Respondents



The expression of the attributes developed by the athletes was measured in the endeavor to implement character development ideas during the training program. Table 4 shows the evaluation result for the degree of influence. The table shows that the general average of the effect on the athletes' character is high, as indicated by players and coaches. The total standards of athletes (4.51) and coaches (4.62), both of which are below the highest level, show this conclusion. Setting a good example is the most overlooked aspect of character development by sportsmen. It alludes to demonstrating what they expect others to do. Coaches, on the other hand, believe that setting high expectations for behavior has the least impact on character development. The most effective claimed by sportsmen, however, is on the traits of valuing their games, oneself, and others, with an average rating of 4.70, which is extremely high. It denotes that the effect is exceptional. Respecting their games, thyself, and others (4.81) and respecting the official or the time (4.81) are also considered the most common effects of character building among coaches.

The data supported the concept of sports as a highly organized, rule-governed physical activity. A rule should be obeyed if one exists. These characteristics were seen in contests where game rules are implemented, and management violations or infractions are sanctioned based on the severity of the violations.

4. Correlation Between the Level of Application of Mental Toughness and Character Building

To determine if there is a correlation between the variables, Table 5 shows the respondents' perceptions of the relationship between mental toughness and character development. It demonstrates that the relationship is modest, with a highly significant value of 0.5863. This indicates that the level of mental toughness training a student-athlete receives has a substantial impact on their character development. Because a competent coach is a great life teacher, this is true when leadership and verbal persuasion from coaching staff are identified as the two main reasons why university students participate in sports Omar-Fauzee, et al., (2009). To substantiate this claim, the researchers built a

sports program to encourage students who have the potential to join their school's varsity program, and it was a success that student-athletes who pursued joining the sports program developed their leadership potentials and other attributes. This demonstrates that coaches can push athletes to achieve their goals by influencing their participation. As a result, coaches and instructors must work to build situations on the playing fields that promote ideals of ethics, moral reasoning, character, and sportsmanship (Stoner, 2004).

Table 5. Correlation Between Mental Toughness and Character Building

Mental Toughness	4.21	Moderately Applied
Character Building	4.6	Fully Applied
Correlation Coefficient	0.5863**	Moderate

In addition, Gilas Pilipinas coach Reyes (2013) explained how the Philippines came close to winning the FIBA Asia Championship thanks to the formula he devised for his team: Attitude; Basics; Conditioning; Drills (ABCD). Jones, et al. (2007) affirmed Coach Chot's view that the initial start for the development of mental toughness is attitude/mindset, and that if athletes acquire mental toughness, peak performance will follow. As a result, mental toughness and character development are intertwined in the success of such an attempt.

J. Discussions

The purpose of this study was to determine the extent of application of mental toughness and character-building among athletes and coaches in Pampanga, as well as the respondents' socio-demographic profile. The extent to which mental toughness and character-building influence one another, as well as whether there is a link between the two, were investigated. Athletes and coaches from several institutions and colleges in Pampanga were randomly picked as responses.

The findings reveal that athletes and coaches have similar levels of mental toughness application. The application levels, as well as the various components, ranged from partially to entirely applied. The players' and coaches' levels of application for character building were not considerably different. The following socio-biographic profiles were assessed in the study: Gender, sports participation, and coaching experience are all factors to consider. The respondents' total level of application in terms of mental toughness and character-building ranged from slightly applied to fully apply, with no significant differences between gender, sports, or years of coaching. However, the respondents ranged greatly in their application of mental toughness and character-building, with the oldest group of

respondents, to which the coaches belonged, having the highest levels of application.

The players and coaches agreed on the degree of effect/impact for the qualities/traits of mental toughness and character-building. The degree of impact ranged from moderate to severe. Finally, the respondents' mental toughness and character development had a moderate and substantial association.

K. Conclusions

Athletes and coaches apply a moderate amount of mental toughness and character-building to their training.

When the respondent's gender, type of sport, and years of coaching are considered, the level of application on mental toughness and character-building does not differ considerably, but it does differ greatly when the respondents' age is considered.

There is a significant impact on the responders' mental toughness and character-building results.

There is a considerable moderate association between the respondent's level of mental toughness application and the athletes' character development.

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X-Ray Based COVID-19 Detection System

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Abstract

The World Health Organization (WHO) recognized COVID-19 as the cause of a worldwide pandemic in 2019. The disease is usually contagious, and those who are infected can quickly pass it to others with whom they originate into contact. As a result, observing is an effective way to stop the virus from spreading more. Another disease caused by a pandemic the same as COVID-19 is pneumonia. This is often significantly unsafe for youngsters, individuals over 65 years getting on, and people with health issues or immune systems that are affected. In this paper, we have classified COVID-19 and pneumonia using deep transfer learning. We have used the VGG16 architecture, which was constructed by collecting dataset of COVID-19, Pneumonia and normal X-Ray images. Our main objective is to ease the work of radiologist by providing a Graphical User Interface which takes x-ray as input and can directly distinguish whether or not patient has COVID-19, pneumonia or is normal.

Keywords

COVID-19, Pneumonia, X-Ray, VGG-16

I. INTRODUCTION

Pneumonia (lung infection) is associated with Nursing acute pulmonary illness it's associated with Nursing inflammatory conditions usually induced by pathogens and different medical specialty agents. There are several distinguishing approaches for classifying respiratory disease. Based on different pathogens pneumonia is categorized into two i.e infectious and non-infectious On New Year's Eve, 2019, World Health Organization received a report of a bunch of unidentified respiratory disease cases in Wuhan, Hubei Province, China. Associate in the Nursing unknown new virus has been detected in calendar month 2020. An awfully too bad coronavirus pandemic (COVID-19) seems to be the worst pandemic in history. In terms of the second wave of COVID-19, Asian country is among the foremost affected regions within the world. The number of affected people was 360,960 in Asian countries on April 26, 2021, and is quickly growing. The virus is progressively and so is growing and so are often caught at any age, resulting in severe diseases. Besides respiratory diseases, the infection rate of COVID-19 is pretty high. COVID-19 could be terribly infectious agent unwellness caused by SARS-CoV-2 and is the largest pandemic throughout the world since the 1918 respiratory disease, a natural event that killed over 9 million folks worldwide. CNNs is appropriate to deal with this kind of drawback. With technology development, a lot of metrics within which radiology-based technique is most popular; and most helpful are being created. The diagnostic radiology ways for respiratory organ unwellness embrace pectoral X-ray imaging, CT scans, and MRI, which is totally effective and efficient chest X-ray imaging ways, likewise as accessible to hospitals, and have reduced indefinite-quantity exposures to people. However, the identification of

respiratory disease and COVID-19 with X-ray pictures remains a colossal job, even for competent and skilled clinicians, as X-ray photos offer comparable location options for different sicknesses, as well as respiratory organ illness. This study offers a profound learning methodology for the identification of patients with SARS-CoV-2. Feature extraction with wonderful performance could also be accomplished within the classification within the CNN model. The CNN model uses filter-based extraction options, which can be effectively classified. CNN will categorize sophisticated identity footage. X-ray instrumentation is affordable, time-effective, and compact in majority of clinics. Deep learning could also be accustomed to determine COVID-19 and respiratory disease, in keeping with new analysis. To resolve this kind of drawback, convolutional neural networking, or CNN, is a superb selection. This study will also assist fewer underdeveloped nations CXR analysis includes identification of a pectoral illness. The majority of studies, as well as chest X-ray imaging, have incontestable Associate in Nursing accuracy of 90–94 Using chest X-ray images to train pre-trained models for transfer learning. The pre-trained models for Image Classification are VGG-16, ResNet50, InceptionV3 and Efficient Net .We've selected VGG-16 as our design. The VGG-16 is one of the foremost widespread pre-trained models for image classification. Introduced within known ILSVRC 2014 Conference, it had been and remains the model to beat even these days.

II. Literature Survey

Automatic Detection of COVID-19 from Chest X-ray Images with Convolutional Neural Networks (1)

Mass testing and early detection of COVID-19 play, a vital role in preventing the unfolding of this recent world pandemic. Time, cost, and accuracy are the few major factors

in any disease detection method specially COVID-19. To deal with these problems, the CNN primarily based model is planned during this paper for detection COVID-19 cases from patients' chest X rays a group of 330 chest X-ray pictures that are equally divided into 2 classes: 'COVID-19' and 'Normal', are used for coaching the model. Similarly, Associate in nursing equally divided the image set of eighty-two chest X-rays are used for validation of the model. This model performs with accuracy and exactitude of ninety-seven. 56% and 95.34% severally. Moreover, this model is compared to the opposite 2 CNN models with a distinct variety of convolutional layers. The comparative studies show a higher F1-score and overall performance of the planned model (Model 1) than that of different 2. This model is improved more with the provision of the larger dataset. So, CNN has nice prospects in detecting COVID-19 with terribly restricted time, resources, and costs. although the planned model shows promising results, it's by no means clinically tested. This model desires more enhancements and clinical testing for it to figure in clinical diagnosing.(1)

Detecting SARS-CoV-2 From Chest X-Ray Using Artificial Intelligence (2)

CXR images of 262 patients with Covid symptoms, and 1583 images of patients with diagnosed pneumonia, were obtained from the Kaggle COVID-19 chest X-ray dataset.

Results- In this case, VGG16 and MobileNetV2 outperformed all other models in terms of accuracy, precision, recall. However, the Res-Net50 model showed the worst performance with 85% accuracy.

Drawbacks- The limited availability of data represented a challenge to confidently assess the performance of our models. Open databases of COVID-19 patient records, especially those containing chest X-ray images, are rapidly expanding and should be considered in ongoing future studies (2)

Computer Vision and Radiology for COVID-19 Detection. (3)

In this paper, we studied about a new method to detect the COVID-19 virus using X-Ray images. The enforced methodology conjointly differentiates the patients plagued by respiratory disorder and COVID-19 as each have equivalent symptoms and patients sometimes got confused between the 2. From this paper, we understood that detecting COVID using X-Ray is much cheaper than the medical COVID-19 test kit and as fast as the current thermal imaging technique. Hence, can be used for the first screening at airports, hotels, shopping centers. One of the main drawbacks of this research is the lack of data quality. The presently obtainable knowledge assortment is just too restricted to get progressive performance and to switch the thermal imaging technique. Our current project is in the early stage to search for new methods to detect COVID. We believe that this paper will motivate other researchers to find new methods for detecting potential patients infected with the virus without the explicit use of medical COVID test kits.

(3)Chest X-ray findings monitoring COVID-19 disease course and severity. (4)

CXRs are a good monitor of COVID-19 chest manifestations and their scoring system provides an accurate method to predict the disease severity. Our study also revealed a positive correlation between the patients' age and total severity score to the final disease outcome providing a good indicator for clinicians to identify at an early stage the patients with the highest risk and plan specific treatment strategies for them. (4)

III. Methodology

Currently, COVID-19 can be detected by PCR tests which take samples using cotton swabs from the nose which makes people uncomfortable. Another way is the RDT test which uses the sample taken from the throat. There are other ways like blood tests which can also be used to detect the COVID-19. We are proposing a method in which we take X-Rays of the thoracic region of a person and we have applied different machine learning techniques to detect whether the person has COVID or Pneumonia. We have used Python language for data analysis which can solve deep learning problems easily. For machine learning projects first step is to gather a dataset. So we have collected dataset from Kaggle, which is a subsidiary of google. The quantity of the dataset plays an important role as more the data the accuracy will be more.

Description of the data set

So we have used 15000 images for our project. From which we have used 12000 for training our model and 3000 for testing the model. Our dataset is divided into three major categories i.e COVID-19, Pneumonia and Normal images.

Here is the sample of each category

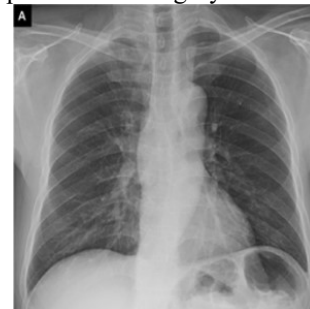


Figure 1
X-Ray of COVID-19 affected chest

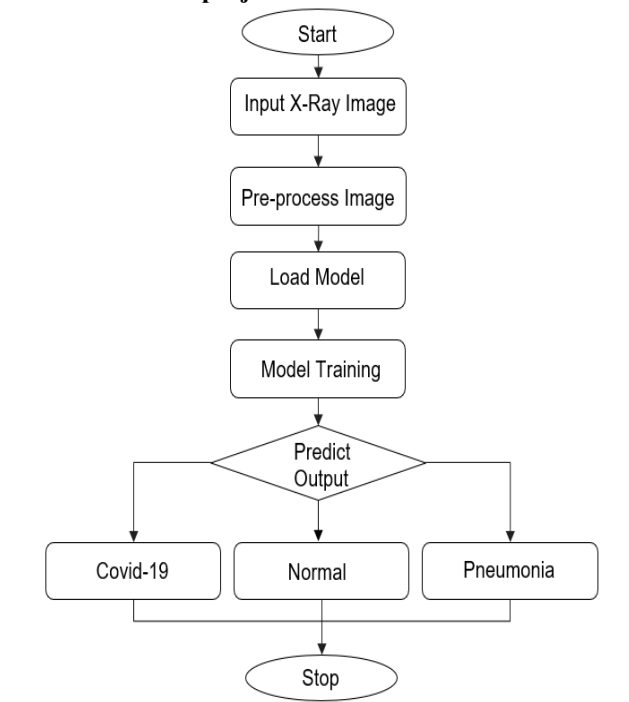


Figure 2
X-Ray of Pneumonia affected chest



Figure 3
Normal chest X-Ray

Flowchart of the project

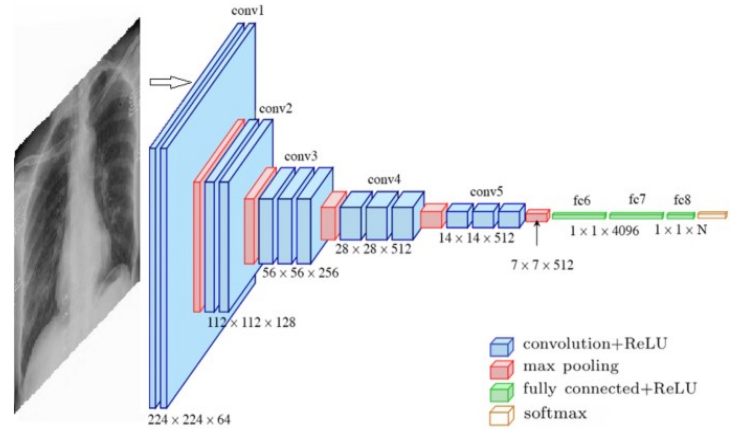


As we know we can't use raw data so we have to preprocess our data before using it. We have used an image data generator for preprocessing. Image data generator uses image augmentation which is a technique of applying different transformations to original images such as rescaling shear resizing, etc. As there are different images with different pixel values so we have used rescaling to make the pixel values of all images the same. We have also changed the size of images into 224 by 224 as it's a standard size in VGG16 Architecture. To do these changes we have loaded other libraries such as

- Tensorflow helps us to classify our data, also it allows creating neural networks with many layers
- Numpy is used to construct arrays
- Os is used for creating, removing, fetching and changing data in folders
- Matplotlib is used for plotting graphs
- Cv2 for identifying the images

After preprocessing, we have assigned each category into numbers so it will be easy for our model to take input and give output. We assigned 0 to COVID, 1 to normal and 2 to pneumonia.

Then we load the pre-trained model which is VGG-16.



VGG-16 is a convolution network architecture. As shown in the image, this architecture contains convolutional layers which are followed by the other layers. The pooling layers are responsible for making the layers more narrow. The 16 in VGG16 depicts the number of layers that have weights. In VGG16 there are thirteen convolutional layers, five Max Pooling layers, and three Dense layers which sum up to 21 layers but it has only sixteen weights layers i.e., learnable parameters layer.

VGG16 takes input tensor size as 224, 244 with 3 RGB channel

The advantage of using VGG-16 is that it doesn't have a large number of hyperparameters instead it have convolution layers of 3x3 filter, max pool layer of 2x2 filter and same padding.

The convolution and max pool layers are consistently arranged throughout the whole architecture

The number of filters in Conv-1 layer, Conv 2- layer, Conv-3 layer is 64, 128, 256 resp. whereas filters in Conv-4 and 5 are 512.

3 fully connected layers follow a stack of convolution layer and soft-max layer is the final layer

Model training –

There are different layers in the architecture of VGG-16 –
 Convolution layers - Convolutional layers are the layer where filters are applied to the original image, or to other feature maps in a deep CNN.

Max pooling layers - It selects the brighter pixels from the image. It is useful when the background of the image is dark.

Dense layers - Dense Layer is used to classify images based on output from convolutional layers.

We have used 2 activations on a dense layer

First is relu (Rectified Linear Unit) activation which is added to layers so that all the negative values are not passed to the next layer.

The Second is the softmax layer which will give an output value between 0 1 or 2 based on the confidence of the model that which class the images belongs to.

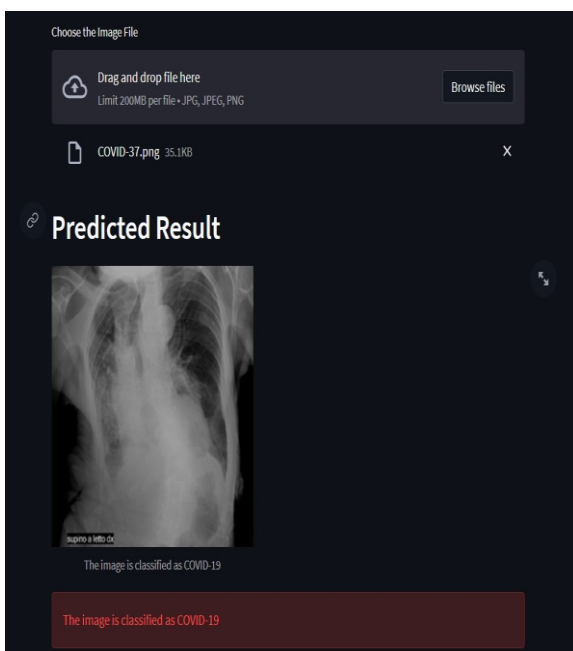
The dropout layer is used to fix the over-fitting issue. Input data may have some of the unwanted data as Noise which will be removed by this layer.

Epoch indicates the number of passes of the entire training dataset the machine learning algorithm has completed so we have completed 50 epochs for our model.

IV. RESULTS/CONCLUSION

As cases are increasing day by day, since the spreading rate of covid-19 is very fast, to prevent these a faster detection system is needed. As there are many other methods present nowadays to detect COVID-19, this system is using CXR to detect COVID -19 and also distinguish it from pneumonia very efficiently in a cheaper rate than the medical COVID-19 test kit and as fast as the current thermal imaging technique. So we conclude that this proposed system is time-saving with faster detection of COVID-19 and will also distinguish between Pneumonia.

For the ease of use of professionals we came up with a user friendly interface in which the user just has to put the image in the format jpg, jpeg or png and then it will predict the results.



V. Future Scope

We have successfully detected COVID-19, pneumonia and normal scans, and it shows the scope of applying such techniques in the future to alter diagnosing tasks in the future. A massive dataset of chest X-rays is needed to validate our projected model on that. It is also suggested to consult medical professionals for any sensible use case of this

project. We tried to develop a perfect detection system but it will more contribute towards the research about possible and economically favorable ways. Such strategies could also be pursued for additional analysis to prove their real case implementation.

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Correlation study between teaching and learning activities and Competency exam

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Abstract

Correlation study between teaching and learning activities and competency exam brought different effects on the nursing students enrolled in the college of nursing. Teachers' education is one of the most relevant interest of research in used this interest that lead to changes in the new paradigm of education. The study aims to determine the correlation between the teaching learning activities and competency exam. Specifically, the study will clarify the relationship between the teaching learning activities and competency exam. Further, the study will determine the effectiveness of the different teaching learning activities used to facilitate learning of the student and to evaluate the knowledge learn through competency exam. The study utilized the descriptive method with quantitative approach. Results showed that the item that got the highest weighted mean was questioning. Student most likely agreed on questioning which either be in terms of quizzes or multiple choice when given into the examination. The item that got the lowest weighted mean was problem solving. Not all students in favour of problem solving because as interviewed they got difficulty in solution because they are nurses not engineers. In relation to in effectiveness used to evaluate the knowledge learned through competency exam the result showed that the indicator that got the highest weighted mean are multiple choice question and demonstration of practical skills (return demonstration of nursing procedures). Nursing students are very much aware of multiple choices question and more expert on return demonstration of practical nursing skills. They love to do the nursing procedures because they really wanted the profession. For the item that got the lowest weighted mean result was the f problem to solve like intravenous and medicines calculation, calorie and community vital statistics computation. Nurses actually has to solve a medicines and IV calculation but for them they are telling that they are weak in mathematics but they are really trying their very best to solve all the solution correctly because they are dealing with the lives of patients. The result of the study in correlation to the effectiveness of the teaching learning activities and competency exam is significant.

Keywords

Correlation Study Between Teaching and Learning Activities and Competency Exam

I. INTRODUCTION

One of the key issues in higher education towards the end of the 20 th century was the debate about the respective virtues and requirements of traditional academic education and vocational education. Many professions once wholly practiced by persons not holding a university degree saw increased demands for university training.

Teachers' education is one of the most relevant interest of research transfer and use and this interest it's motivated by the fact that teaching represents an important profession that might lead to changes in the contemporary society, especially in the light of the new paradigm of education based on the constructivism. This context marks a shift in which teachers are considered as "knowledge users" and redefine their position towards as "knowledge makers". However, knowledge making still remains in the scope of researchers and university educators' interest and is beyond from the actual needs of education. Beretter, C. (2012).

In this new professional culture, adapted to a changing society, teaching as a profession is experiencing a continuous transformation and innovation process and education

professionals appear to be researchers and knowledge users able to think thoroughly upon their own professional needs and upon the new topics arising in their professional field. There is therefore a shift from a passive to an active position enabling educators to become aware of how complex their field is and to understand that this field should meet the social, cultural, historical, philosophical, and psychological context shaping it. Teachers thus become aware not only of the students' immediate needs and the facts occurring during their own classes, but also of their own training and professional needs.

Good practices in teaching, learning and assessment, in particular how teaching, learning activities and assessment can be best organised in order to allow students to reach the intended learning outcomes of a course of study. As cited Biggs (2002) describes this as the 'alignment' of teaching, learning activities, and assessment with the intended learning outcomes of a course of study.

A wide range of teaching techniques is used in universities. The set of teaching techniques strongly depends on the instructional form of education (face to face education, education by correspondence or distance education.

Example of these teaching are Seminar (small group teaching), tutorials, research seminar, exercise classes or courses, workshops (classroom based practical classes), problem-solving sessions, laboratory teaching, demonstration classes, placement (internship/traineeship), work based practice, fieldwork, online / Distance or e-learning: which may be paper based or ICT based.

One way of gaining some insights into the teaching techniques used is to look at what learning activities students are also required to do in a programme or part of a programme of study. As with teaching, learning activities called by the same name can differ quite widely. Apart from attending lectures (participating in lectures) or reading books and journals, the following (inevitably partial) list of commonly used learning activities gives some idea of the richness that is possible in aligned teaching and learning such as conduct searches for relevant materials in libraries and on-line, survey literature, summarize those readings which seem to be most relevant to their current needs, learn to pose problems as well as solve those set by the lecturer, conduct increasingly complex even if small scale, research, practise technical or laboratory skills, practice professional skills (e.g. in Nursing, Medicine, Teaching), research and write papers, reports, dissertations of increasing difficulty (in terms of size and complexity of the material), work with other students to co-produce a report/design/answer to a problem, prepare and make oral presentations, either in groups or individually, make constructive criticism of the work and others, and use the criticism of others productively, chair and participate usefully in meetings (of seminar groups, for example), lead or be useful members of teams, work under time constraint to meet deadlines, communicate questions and findings with others using a variety of media, learn to criticize their own work.

In order to face these new challenges, university programs have to adapt their study programs and methods in order to develop students' research competences, especially those related to conduct research projects and also to be able to transfer their knowledge and academic experiences to their professional teaching practice. For this propose, the paradigm of "research-based education" seems to be one of the most adequate to be implemented in the universities study proposals.

Research-based teacher education has lately received increasing interest among both re-searchers of teacher education (e.g. Jakku-Sihvonen & Niemi, 2006, 2007 and Toom, et al. 2010) and public discussion. Research-based teacher education has been studied in different contexts and education levels, and has a crucial interest in master and doctoral studies, especially under Bologna process where teaching professionals are trained through postgraduate studies. In order to develop research competences of future professionals in the field of teaching, activities of practicing inquiry and research are needed as part of the study programs. Most programmes described in Tuning use a range of modes of assessment at different points in the programme. Coursework assignments, which may be formally assessed and graded - or not - assess student performance as the programme or part of it progresses, like tests of knowledge or skill, oral presentations, laboratory reports. analyses, e.g. of

texts, data, performance of skills while being observed e.g. in work placements, laboratories, work placement reports or diaries, professional portfolios, fieldwork reports, written essays or reports or parts of these, e.g. a written review of relevant literature; a critique of contrasting research papers.

Central to all of these ways of assessing student work during a programme is feedback. The assessment is said to be formative, because the students learn by doing the work and then having the lecturer comment on how well they have achieved it, where they have done less well, how to improve, and what steps might be taken to do this

In any programme of study, or parts of it, there is a need for summative assessment. Sometimes the coursework discussed above performs both a formative and a summative function. The grade given is the summation of the student's achievement in that element, and the feedback from lecturer – and sometimes peers as well – is the formative part.

Some form of invigilated examination is the usual format for summative assessment; this may be written or oral. Written examinations have the virtue of cheapness and security: a large cohort can be examined at the same time, while oral examinations can probe a student's learning in ways that a written format normally does not allow.

The focus of the present study is the correlation between teaching learning activities and competency exam. The rationale of conducting this study is to know the effectiveness of the different teaching learning activities used to facilitate and evaluate knowledge learn through competency exam.

II. OBJECTIVES OF THE STUDY

The study aims to determine the correlation between the teaching learning activities and competency exam. Specifically, the study will clarify the relationship between the teaching learning activities and competency exam. Further, the study will determine the effectiveness of the different teaching learning activities used to facilitate learning of the student and to evaluate the knowledge learn through competency exam.

Literature Review

The work that was done in mapping the curriculum, writing your outcomes and planning for what it will teach the students, and what they will need to master in the course, all comes to life in the classroom - in lectures, tutorials and students' own engagement, and with the knowledge. Designing engaging, relevant and stimulating teaching and learning activities that excite and motivate lecturers, students and tutors is thus a crucial part of a successful aligned and constructive curriculum.

A seminal paper by John Biggs argues that good teaching focuses on what students are doing (Biggs 2012 [1999]). The focus should not be on what the lecturer or tutor is saying or doing, or how much they know; it should not even be on what students are hearing. Rather, the focus of good teaching must be on what students are actually doing with the knowledge, skills and competencies they are acquiring, because learning doesn't occur through just listening; action is also required.

The following resources are teaching and learning activities that can be adapted and used in a range of classroom situations, with large and small groups of students like

concept mapping, participatory Learning in Action (PLA) Techniques, questioning, formative quizzes, problem-solving, debates, role-plays, free writing, small group activities

In some cases this competence is described in more general terms, such as “facing concrete problems by using basic concepts”. In most cases, however, it is described as the ability to perform specific academic tasks, which may vary according to the discipline. In initial teacher education there is a clear projection into the future teaching profession. In the second cycle this competence is often described in more professional terms, and may be more closely associated with activities to be performed in the workplace such as collecting information from diverse sources and writing a report on a complex issue.

The different teaching methods used to help the students achieve this competence reflect different approaches to practice. Accordingly, the opportunities for practice provided inside and outside the institution are described differently in the various disciplines, as exercises of various types, practical classes, lecture sessions, seminars, field classes, laboratory sessions, industrial projects, industrial placements, study visits, field excursions, and student teaching practice. Some disciplines suggest that this competence can be best developed by doing a project or writing a thesis. Others, like Business Studies, Chemistry, Mathematics and Education emphasise the need to provide appropriate tools and methods as well as opportunities for problem solving. The Education group emphasises the importance of reflection on work done. Earth Science (Geology) reported the centrality of this competence to the development of subject knowledge.

Evaluation of Knowledge Learn

The importance of exit Examination as one way of giving competency exam is a test that students must pass to receive a diploma and graduate from high school in the United States. These are usually criterion-referenced tests which were implemented as part of a comprehensive standards-based education reform program which sets into place new standards intended to increase the learning of all students.

When any test is directly tied to significant consequences, such as determining whether the student may receive a high school diploma, it is called a high-stakes test. Many organizations such as the National Council of Teachers of Mathematics (NCTM) oppose high-stakes tests in general, with the NCTM saying that “placing too much emphasis on a single test or on testing can undermine the quality of education and jeopardize equality of opportunity.”¹ At the same time, almost all states that hold an exit exam for graduation allow students to take the test multiple times and further allow routes to graduation for students that fail.

In 2011, 24 states required passing a high school exit examination for graduation, and three additional states had legislation instituting such exams in the future.

However, questions remain as to which system is the best to assess the academic competency of graduating students. By far the most often used tool of assessment in the multiple-choice examination, in many cases combined with a writing sample. This, in combination with passing grades in key subjects and a minimum number of credit units, seems to be a growing method of choice for ensuring minimum

competency levels in high school graduates in the United States. Because graduation from high school may be dependent upon passing an “exit exam,” the process has been dubbed “high stakes testing.”

III. METHODS

Research Design

The study utilized the descriptive method with quantitative approach. Descriptive method is used to learn the who, what, when, where, and even the how of a study which maybe simple and complex and concerns a univariate question in which one seeks about, or states something about (Cooper and Schindler, (2008).

Participants

The participants of this study were the nursing students from first year to fourth year level. of the Lyceum of the Philippines University Batangas, College Nursing 2017 to 2018.

Instruments

The researcher used a self-structured questionnaire that is based on pertinent literature in gathering data to determine the correlation of teaching learning activities and competency exam.

To come up with the good structured questionnaire, the researchers have resorted reading books, journals, unpublished thesis and browsing the internet. The choice of instruments was based on factors related to the objectives of the study, type of data to be collected and subject’s educational and developmental attainment.

It consists of two parts: Part I contained the different types of teaching learning activities and second Part contains the effectiveness of the teaching learning activities of the students through competency exam.

Data Gathering Procedures

Sets of survey questionnaire will be formulated base on the specific questions raised in the study. Unstructured interview and observation was also conducted by the researcher during her visits to the classroom of the participants of the study.

In addition, in the process of validation procedure, sets of questions will be drafted and after their compilation, they will be finalize, edit and submit to her adviser and experts for comments and suggestions for improvement. After suggestions/recommendations will be noted and consider; then, the instrument will be again improve, edit for corrections, and once more will be finalize for approval.

Once the researcher will be able to get the approval of her adviser, the sets of instruments will be pre-tested for reliability, effectiveness and validity where the researcher will personally conduct the dry run, taking into the account the suitability of the survey instrument.

Moreover, clear instructions/directions of what to do with the list of questions will also be provided. Each questionnaire will also have cover letter cordially and courteously be compose, neatly organized and will be encoded containing the required parts of the letter request.

The judgmental validation will further be made, the sets of survey instruments put in final form and be administering personally to the groups of respondents.

Data Analysis

All the data will be collected from the surveys will be culled and summarize in tabular form and treated using arithmetical and statistical tools, which include: Percentage. This tool is used to get the frequency of distribution to an item and relevance of the data. It was used in determining the

quantitative information about the personal data of the groups of respondents.

Weighted mean. This tool is also utilized primarily for quantitative analysis to determine the responses that are typical to the respondents as a group.

Table 1
Correlation Between the Teaching Learning Activities and Competency Exam of Different Teaching Learning Activities

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Concept Mapping	4.40	Agree	3
2. Questioning	4.96	Strongly agree	1
3. Formative Quizzes	4.80	Strongly agree	2
4. Problem Solving	4.08	Agree	5
5. Role Plays	4.21	Agree	4
Over-all Mean	4.48	Agree	

Table 1 pertains to correlation between the teaching learning activities and competency exam of different teaching learning activities. The item that got the highest weighted mean of 4.96 is questioning in with verbal interpretation of strongly agree. This means that student most likely agreed on questioning which either be in terms of quizzes or multiple choice when given into the examination. Compared to the item that got the lowest weighted mean of

4.08 is problem solving and with verbal interpretation of agree. Not all students in favour of problem solving because as interviewed they got difficulty in solution because they are nurses not engineers. For the overall mean it got 4.48 and verbal interpretation of agree. These list of teaching learning activities it only got agree because some students were not in favour of all these teaching learning activities.

Table 2
Effectiveness of teaching learning activities used to evaluate the knowledge learn through competency exam.

Indicators	Weighted Mean	Verbal Interpretation	Rank
A. Written examination			
1. Essays	4.92	Strongly Agree	2
2. Multiple choice question	4.96	Strongly Agree	1
3. Problem to solve (IV Computation , medicines Calculation, Calories computation, Community vital statistics)	4.80	Strongly Agree	4
4. Analyses of cases	4.80	Strongly Agree	4
5. Literature review (Base on memory, open book or take away procedure)	4.88	Strongly Agree	3
B. Oral Examination			
1. Oral questioning it depends on the subject.	4.88	Strongly Agree	3
2. Demonstration of practical skills (return demonstration of nursing procedures)	4.96	Strongly Agree	1
Over-all Mean	4.90	Strongly Agree	

The table above states the effectiveness teaching learning activities used to evaluate the knowledge learn through competency exam. The indicator that got the highest weighted mean are multiple choice question and demonstration of practical skills (return demonstration of nursing procedures). Nursing students are very much aware of multiple choices question and more expert on return demonstration of practical nursing skills. They love to do the nursing procedures because they really wanted the profession. For the item that got the lowest weighted mean

result is 4.80 to the item of problem to solve like intravenous and medicines calculation, calorie and community vital statistics computation with verbal interpretation, still of strongly agree. Nurses actually has to solve a medicines and IV calculation but for them they are telling that they are weak in mathematics but they are really trying their very best to solve all the solution correctly because they are dealing with the lives of patients. The overall weighted mean of this table is 4.90 and still under strongly agree.

Table 3
Relationship Between the Teaching Learning Activities and Competency Exam

Indicators	Pearson r	Degree of Relationship	P Value	Decision	Interpretation
A. Oral Examination	0.762	High relationship	0.000	rejected	significant
B. Written Examination	0.853	Very high relationship	0.000	rejected	significant
C. Practical Examination	0.703	High relationship	0.000	rejected	significant

The table above shows that the computed r value indicates a very high relationship and the obtained value is greater than the critical value of 0.273 at 0.05 level of significant of $df = 49$. In addition to this the resulted significant value were less than 0.05 alpha level. This means that there is a significant relationship between the teaching learning activities and competency examination of different teaching learning activities. So it means that nursing students were satisfied on the oral examination, written examination and practical examination in which the correlation between these three indicators /variables, the correlation is high and significant.

As cited by Hoddinott, J. & Wuetherick, B. 2013, in this new professional culture, adapted to a changing society, teaching as a profession is experiencing a continuous transformation and innovation process and education professionals appear to be researchers and knowledge users able to think thoroughly upon their own professional needs and upon the new topics arising in their professional field.

IV. CONCLUSION:

1. The correlation between the teaching learning activities and competency exam of different teaching learning activities. The item that got the highest weighted mean of 4.96 is questioning in with verbal interpretation of strongly agree. This means that student most likely agreed on questioning which either be in terms of quizzes or multiple choice when given into the examination. Compared to the item that got the lowest weighted mean of 4.08 is problem solving and with verbal interpretation of agree. Not all students in favour of problem solving because as interviewed they got difficulty in solution because they are nurses not engineers. For the overall mean it got 4.48 and verbal interpretation of agree. These list of teaching learning activities it only got agree because some students were not in favour of all these teaching learning activities.
2. The effectiveness of teaching learning activities used to evaluate the knowledge learn through competency exam. The indicator that got the highest weighted mean are multiple choice question and demonstration of practical skills (return demonstration of nursing procedures). Nursing students are very much aware of multiple choices question and more expert on return demonstration of practical nursing skills. They love to do the nursing procedures because they really wanted the profession. For the item that got the lowest weighted mean result is 4.80 to the item of problem to solve like intravenous and medicines calculation, calorie and community vital statistics computation with verbal interpretation, still of strongly agree. Nurses actually has to solve a medicines and IV calculation but for them they are

telling that they are weak in mathematics but they are really trying their very best to solve all the solution correctly because they are dealing with the lives of patients. The overall weighted mean of this table is 4.90 and still under strongly agree.

3. The computed r value indicates a very high relationship and the obtained value is greater than the critical value of 0.273 at 0.05 level of significant of $df = 49$. In addition to this the resulted significant value were less than 0.05 alpha level. This means that there is a significant relationship between the teaching learning activities and competency examination of different teaching learning activities. So it means that nursing students were satisfied on the oral examination, written examination and practical examination in which the correlation between these three indicators /variables, the correlation is high and significant.

V. RECOMMENDATION:

1. The teaching learning activities used by the professors of the College of Nursing should be maintained and a little of enhancement.
2. The effectively of the present teaching learning activities used should be improved in the aspect of written examination.
3. Even though the teaching learning activities used by the college is with significant correlation with the competency exam, still recommended for enhancement and improvement basing on the new trends of nursing.

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Development and evaluation of cognitive game application for Filipino elderlies: A Design - Based Research

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Abstract

Many types of research exposed those games have been pointed out as training interventions to remediate cognitive decline among elderlies. In this study, the game apps were casual games that covered the cognitive domains: affect attention, executive functioning, memory, language, and visuospatial function. The participants tested the game which is in real-world scenarios with different variables. Various components of the design were refined by the developer using Design-Based Research composed of two cycles. It involves: ((I) Evaluating whether the game environment was accepted with the structure of cognitive training and exploring suggestions for its redesign to improve the usability; and (II) Designing and testing the game app to verify and refine its context and usability. Using Davis's Technology Acceptance Model (TAM) questionnaire, the fifteen elderly participants agreed on its usefulness and ease of use. They showed a positive attitude and intentions toward using it. However, evaluation from the game developers proposed some more enhancements on an interface, interaction, and feedback mechanisms. This study suggests that the game app's efficacy as a cognitive enhancer may be tested on a larger scale and more prolonged period.

Keywords

cognitive decline, cognitive domains, cognitive game app, Design-Based Research (DBR), elderlies

INTRODUCTION

The population of the world is aging today. Executive director of the Asia Pacific Risk Center, Wolfram Hedrich, said that the Asia-Pacific Region is aging faster than any other region. The Philippines is contributing to that phenomenon. The country's 60-year-old population is projected to grow by 4.2 percent, while it is estimated that the 80-year-old and older people will increase by 0.4 percent from 2010 to 2030 (Help Age Global Network 2017b). A report of the Philippine Institute for Development Studies (PIDS) in 2018 found that this country is already heading to becoming an aging society. While it is growing gradually, it is estimated that by 2032, the elderly, or those aged 65 and older, will constitute at least 7 percent of the total population. By 2069 it will have become an "aging society," with at least 14 percent of the people. Although an aging population is a sign of increased growth, it also requires more resources and facilities to meet their needs, particularly their rising mental health needs (Weng et al., 2019).

As evidenced by Neurochemical theory, Localized theory, and Process theory, cognitive aging has gained prominence as domain-specific, age-related cognitive changes that affect importance, executive functioning, memory, language, and visuospatial function at a minimum. In general terms, the effect of biological aging is a decline in both physical and cognitive functioning (Clouston et al., 2013). The World Health Organization (WHO) has thus encouraged healthy

aging as a global priority. Foster and Walker (2015) identified active aging intending to promote the right of older people to remain safe (reducing health and social care costs), staying longer in jobs (reducing pension costs), while still engaging in community and political life. Participants addressed the recommendations in their 2015 conference on how to preserve the memory, ability, and physical function of elderlies promote their social involvement and emphasize the skills and expertise they should possess (Lu et al., 2017).

One way to support the elderly is to undertake research, but the sad reality revealed by Villegas (2014) is that aging in our country remains a highly under-theoretical topic. In 1996, the National Institutes of Health (NIH) was founded in the University of the Philippines Manila, the only government institution that focuses on aging, to tackle this problem. It aims to contribute to the national development and improvement of the Filipinos' quality of life as they age. It will create infinite possibilities for its value-added existence through scientific study, training and education, and specialized services with the aged Filipino. Their groundbreaking work was published in 2006 with the monograph "Maximizing the Quality of Life of the Elderly Through Better Health ." In one of its articles, one written by Dr. Shelley de la Vega, entitled "Research Issues on the Improvement of the Quality of Life of Filipino Older Persons," surveyed that the most significant percentage of senior citizens (elderlies) was found in Southern Tagalog (Region IV) with a contribution of 14.2 percent to the total, and mostly women. Her research also showed that older

people correlated improved quality of life with the area of physical health. They recommended prevalence and longitudinal studies on morbidity and mortality, functional status, and disability, emphasizing major geriatric syndromes such as dementia and delirium to validate this result.

Dominguez et al. (2014) conducted a study. They found that dementia may not be detected as some people still consider cognitive decline part of normal aging. Older people are excused from demanding mental activities and access to timely diagnosis is limited. Another study conducted by Ten Brinker et al. (2018) found that no curative pharmaceutical therapy currently exists for cognitive impairment and dementia; thus, they emphasized that it is essential to identify strategies that promote healthy cognitive aging and minimize cognitive decline. One of which is using technological devices, which is now part of their daily lives.

With the development of technology, elderlies have been allowed to interact very quickly, primarily through devices such as mobile phones. The use of this type of unit, also by them, is increasing in particular. Many studies revealed that technological devices could enhance their well-being and health conditions. It was also found to have strengthened their functional abilities as they play digital games. Jung et al. (2009) found that engaging in this type of game impacts the emotional and physical well-being of the elderly in nursing homes. These games can delay the loss of memory and cognitive impairment and even enhance cognitive skills that are deteriorating due to the phase of aging. Many commercially accessible gaming products, on the other hand, are not appropriate for elderlies (Gerling K.M et al., 2012). An organized approach to digital game design for therapeutic applications and serious games is needed. In addition to developing therapeutic apps and serious games, this Rarely group has academic work on an audience based on age-related changes and deficits (Nap, H.H., 2009). Thus, on these premises that this study was conducted.

Objectives

This study was conducted primarily to evaluate the develop cognitive game application for Filipino elderlies. Specifically, it determined the following on the game app: (1) The level of acceptability in terms of its contexts: (a) perceived usefulness, (b) perceived ease of use, (c) attitude towards using, and (d) intentions to use; (2) Usability heuristics as perceived by elderlies and game developers; and (3) Comments, suggestions, and recommendations from the participants to enhance the game applications.

Materials and Methods

This study employed the Design-Based Research (DBR) used by u, M. H., Lin, W., & Yueh, H. P. (2017). It was adapted from Barab and Squire (2009) in its approach to the relatively recent idea of creating cognitive training games for elderlies. The emphasis of the study was the evolution of a digital game through iterative processes as a design artifact to assess both the theoretical and functional consequences of the games.

Research Design

The cognitive training game created in this study was described as a casual game. In complex real-life settings involving several variables, the game was investigated, and different design aspects were optimized using DBR. Two cycles of design were adopted and are shown in Figure 1.

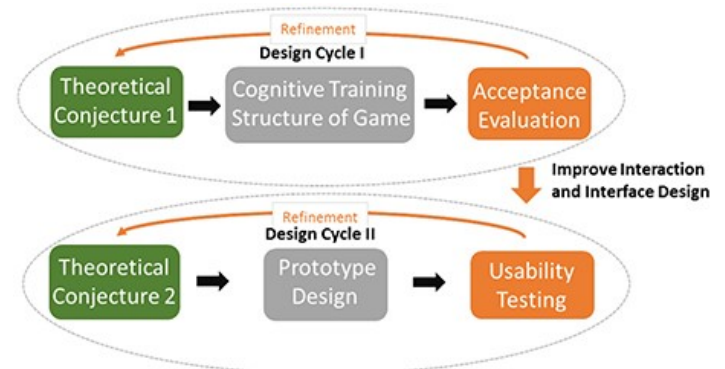


Figure 1. Design-Based Research (DBR) Model

Source: Adapted from Barab and Squire (2004)

The two iterations made successful refinements in style, interpretation, review, and redesign. The **first iteration** concentrated on determining whether the game environment agreed with the cognitive training framework suggested in **Figure 1** and addressed suggestions for enhancing its usability following its redesign.

The **second iteration** focused on designing and testing the structure and function of the game application to verify and improve the meaning and usability of the game. An acceptance assessment and usability testing were carried out in the homes of selected elderlies to obtain the data in genuine use contexts.

Participant Recruitment

There are two groups of participants in this study: the elderly and game developers/I.T. experts. Each participant had to fill up an informed consent form before being given a questionnaire. The said form contains complete information about the study's goal, research process, data collection, potential risk, and compensation.

Fifteen (15) elderlies performed heuristic evaluations of the mobile cognitive game application. They were chosen through purposive and convenience sampling. All of them were retired government employees and had their mobile phones. Five of them were males, and the rests were females. Five (5) game developers/I.T. experts participated in evaluating the game application. They were identified to have developed their casual games before.

Data Collection Procedures

The following steps in Figure 2 on the next page were undertaken in collecting data for this study:



Figure 2. Data Collection Procedure

Interview of the Cognitive Training Structure for the Game App

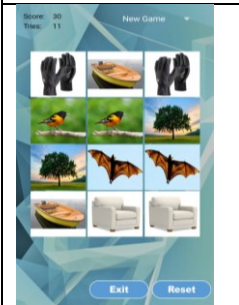
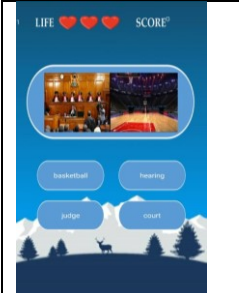
Theoretical foundations of aging cognition and technology were examined and organized into design guidelines to create this cognitive training game application. Based on the literature review provided in Figure 1, the cognitive training framework of the game was first proposed. The researcher conducted a semi-structured interview with three medical doctors of rural health units in the province to solicit their experiences of encounters with those with mild dementia.



Game Selection

According to their goals and characteristics, there is a wide range of games grouped by genres. Genres encourage the creation of games so that existing components can be reused and improved. However, in this study, only the brain and puzzle genres of the mini-games were focused on.

The interview guidelines covered four aspects: (1) What are the everyday life and physical and mental statuses of elderly you have encountered in the rural health unit/facility you are working in? (2) What are cognitive training activities these elderly participate in in your community? (3) Do these elders use gadgets/devices in playing games, and what is their technological ability? (4) Is a cognitive training game design for elderly important? Why or why not? The results of these questions were recorded, encoded, and integrated into the mobile game application development.

The following are the cognitive game apps developed:
 Cognitive Game Apps

Name	Cognitive Domains	Descriptions
 <p>Match Me</p>	memory and attention	This game aims to develop the memory and attention of the elderly. You can get the point if you match the two pics correctly upon pressing them consecutively. Both pics will close whenever you unmatched them, and the matching continues. Recording of many tries can be found on the upper left portion of the gadgets' screen. It can be played in 2 x 2, 2 x 3, or 3 x 4.
 <p>Mi Homo</p>	Memory, language and visuo-spatial function	There are lots of words of the exact spelling but with different meanings. They are called "homonyms." So in this game, two images will be flashed, and the player will select the homonym for it. Whenever the correct name is pressed, a corresponding point will be given. The total attributes for this game is 5.

	<p>Memory, language and visuo-spatial and executive functions</p>	<p>This is a rotation game. The player needs much familiarization with the alphabet (capital and small letters and of how they have been positioned. You need proper identification of whether these letters are in reversed or normal positioning. It must be done quickly since the time limit for each game is 5 seconds. Each correct answer has corresponding 5 points.</p>
<p>Gyre</p>		
	<p>Memory, language and visuo-spatial and executive functions</p>	<p>This game requires much focus and attention because it can be played in 10 seconds only. You must have memorized the colors so that you can match them quickly to their names. For every correct identification, 5 points will be given. Whenever, your score got the highest, you will be considered as the top ranked.</p>

Luana Giovani N. O., et al. (2017). The evaluation centered on the specific features of the games and their experience while playing the game.

Acceptance Evaluation

Elderlies performed an acceptance assessment to determine whether or not the framework of the game's cognitive training was suitable for elderlies. These elderlies were asked to perform heuristic evaluations of the game applications installed in their phones using the Technology Acceptance Model Questionnaire by Davis (2004).

Formative Evaluation and Usability Testing

The elderlies did the formative assessment by answering the Usability Heuristics Questionnaire developed by Santos,

The game developers/I.T. experts also assessed the heuristics for user interface design formulated by Jakob Nielsen. Because they are broad rules of thumb rather than precise usability requirements, they are referred to as "heuristics." It is composed of ten (10) principles that should be met so that the design will be considered usable.

Results and Discussion

Tables 1 through 3 can be found on the following pages to summarize the study results.

Table 1. Acceptability evaluation of mobile game app for the elderlies

Game App Contexts	Weighted Mean	Descriptive Interpretation
A. Perceived Usefulness		
Playing the game app...		
1. helps boost my memory	4.67	VH
2. enhances the performance of my daily task	4.80	VH
3. motivates me to finish tasks quickly	4.67	VH
4. makes me catch up on directives/ instructions	4.27	H
Over-all Usefulness	4.60	Very High Agreement

Table 1. Acceptability evaluation of mobile game app for the elderlies...

Game App Contexts	Weighted Mean	Descriptive Interpretation
B. Perceived Ease of Use		
Playing the game app makes it easy in ...		
1. becoming skillful at using other gadgets and devices.	4.33	VH
2. applying the techno skills in performing daily tasks	4.33	VH
3. understanding instructions and directions.	4.47	VH

4. making decisions more flexible and optional.	4.67	VH
Over-all Ease of Use	4.45	High Agreement
C. Attitude Toward Using		
Playing the game app is ...		V
1. good	4.40	H
2. favorable	4.60	VH
3. a positive influence for me	4.67	VH
4. valuable to use	4.53	VH
5. trendy	4.40	H
Over-all Attitude	4.52	Very High Positivity
D. Intention to Use		
I tend to use the game app to...		
1. apply the strategies learned in my daily tasks.	4.73	VH
2. try to challenge me to get a perfect score.	4.73	VH
3. boost my interest in performing speedy tasks.	4.80	VH
4. intense my desire in playing.	4.80	VH
5. provide multi-approaches in dealing with problems encountered.	4.80	VH
Over-all Intent	4.77	Very High Positivity

Legend:

Weighted Mean (WM)	Descriptive Interpretations(DI)
4.51 – 5.00	Strongly Agree (SA) Very High Agreement/Positivity (VH)
3.51 – 4.50	Partially Agree (PA) High Acceptability/Positivity (H)
2.51 – 3.50	Neither Agree Nor Disagree (NAND) Neither High Nor Low Acceptability/Positivity (NHNL)
1.51 – 2.50	Partially Disagree (PDA) Low Acceptability/Positivity (L)
1.00 – 1.50	Strongly Disagree (SDA) Very Low Acceptability/Positivity (VL)

How high the elder participants accept the mobile game app was presented in Table 1. It should be noted that the utility of the game app with a weighted average of 4.60 has been widely accepted, and its ease of use is highly accepted. They significantly believed that it enhances the performance of their daily tasks (4.80) and helps them decide on a more flexible and optional manner (4.67). Moreover, their attitude

towards using and intention to use it received very high positivity, 4.52 and 4.77, respectively. They also experienced that this game has a positive influence on them that they are very willing to play again and again. This result justifies those elderlies are very glad to play the game app due to their cognitive training benefits.

Table 2a. Usability heuristics for the evaluation of mobile game app for the elderlies
(n = 15 elderly participants)

Heuristics	Weighted Mean	Descriptive Interpretation
The games'...		
1. controls are precise, customizable, and physically comfortable; their respective response actions are immediate.	4.73	VHA
2. the main objective was presented to me since the beginning of the game.	4.67	VHA
3. visual representations can be easily understood by me.	4.67	VHA
4. aesthetics of the screen is pleasing, with visible content, enabling the identification and understanding of its components.	4.60	VHA
5. sessions/matches allow quick start.	4.60	VHA
6. graphics and soundtrack catch my interest.	4.47	HA
7. challenge can be adjusted according to my skill, and is not repetitive nor boring.	4.40	HA
8. layout and menus are intuitive and organized to keep my focus on the game.	4.40	HA
9. allow me to develop skills needed in the future.	4.20	HA

As a player, I ...		
10. am rewarded for my achievements clearly and immediately.	4.49	VHA
11. find a tutorial/help to get familiar with the game.	4.48	HA
12. save the current state from resuming the game later.	4.45	HA
13. can quickly obtain information about everything around me, including my score.	4.44	HA
14. can customize the audio and the video of the game according to their needs.	4.43	HA
Over-all Acceptability	4.51	Very High

Legend:

Weighted Mean (WM)

4.51 – 5.00

3.51 – 4.50

2.51 – 3.50

1.51 – 2.50

1.00 – 1.50

Descriptive Interpretations (DI)

Strongly Agree (SA) Very High Acceptability (VHA)

Partially Agree (PA) High Acceptability (HA)

Neither Agree Nor Disagree (NAND) Neither High Nor Low Acceptability (NHNLA)

Partially Disagree (PDA) Low Acceptability (LA)

Strongly Disagree (SDA) Very Low Acceptability (VLA)

The elderly participants were able to familiarize themselves on the features of the game app as evidence by their acceptability ratings of high to very high (4.20 - 4.73). The following indicators are the notable ones (See Table 2a): game controls are clear, customizable and physically comfortable (4.73), main objective was presented to them since the beginning of the game and visual representations can be easily understood (4.67); aesthetics of the screen is good, with a visible content, enabling the identification and understanding of its components and sessions/matches allow quick start (4.60). The rests of the features were highly accepted. This result indicates that the elderlies acknowledged the very high usability of the game app.

Table 2b. Usability heuristics for the evaluation of mobile game app for the elderlies
 (n = 5 game developers)

Heuristics	Weighted Mean	Descriptive Interpretation
1. Aesthetic and minimalist design - Information that is irrelevant or only occasionally required should not be included in dialogues. In a discourse, each additional unit of information competes with the relevant information units, lowering their relative prominence.	4.60	High
2. Match between system and the real world - The system should speak the players' Instead of using system-oriented terms, utilize words, ideas, and concepts recognizable to the user. Follow real-world norms to present data in a logical and natural sequence.	4.40	High
3. Recognition rather than recall - Minimize the player's memory load by making objects, actions, and options visible. The player should not have to remember information from one part of the dialogue to another. Instructions for using the system should be visible or easily retrievable whenever appropriate.	4.20	High
4. 4. User control and freedom - Players frequently, system functions are chosen by mistake, necessitating the use of a designated "emergency escape" to quit the unwanted state without having to go through an extensive discussion. Support undo and redo.	4.00	High
5. 5. Visibility of system status 6. - The system should always keep players informed about what is going on through appropriate feedback within a reasonable time.	4.00	High
6. Flexibility and efficiency of use - Accelerators — unseen by the novice player — may frequently speed up the interaction for the expert user, allowing the system to accommodate both beginner and experienced users. . Allow players to tailor frequent actions.	4.00	High

7. Consistency and standards - Players should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.	3.80	High
8. Error prevention - Even better than good error messages is a careful design that precludes the occurrence of a problem in the first place either remove error-prone conditions or check for them and give users a confirmation choice before allowing them to proceed to commit to the action.	3.80	High
9. Help players in error detection, diagnosis, and recovery - Error messages should be written in simple English (no codes), clearly state the problem, and offer a helpful remedy.	3.80	High
10. Help and documentation - Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be accessible to search, focused on the player's task, make a list of clear steps to be followed, and keep it manageable.	3.40	Neither High Nor Low
Over-all Usability	4.00	High Usability

Legend:

Weighted Mean (WM)

Descriptive Interpretations (DI)

4.51 – 5.00	Strongly Agree (SA)	Very High Usability (VH)
3.51 – 4.50	Partially Agree (PA)	High Usability (H)
2.51 – 3.50	Neither Agree Nor Disagree (NAND)	Neither High Nor Low Usability (NHNL)
1.51 – 2.50	Partially Disagree (PDA)	Low Usability (L)
1.00 – 1.50	Strongly Disagree (SDA)	Very Low Usability (VL)

Table 2b presents the usability heuristics of the mobile game app as evaluated by the game developers. Though the overall evaluation falls under high usability (4.00), there are still components to be looked into. Specifically, help and documentation (3.40) are necessary whenever they find difficulty playing the games. Next is consistency and standards. Since players looked into patterns, there is a need to give clues whenever malfunctioning exists. This result

justifies that the game developers perceived the game app as highly usability. This is consistent with the result of the study of Adcock et al. (2020) that the training game showed to positively influence physical and cognitive functions. They also emphasized that some aspects of the exergame prototype can and should be improved.

Table 3. Comments/suggestions of the participants regarding the game app

Elderlies	Game Developer
1. Very help and easy to play game app.	<i>Some more enhancements on interface, interaction and feedback mechanism</i>
2. There is a need to embed the directions on how to play and win in the game.	

Conclusions and Recommendations

The following conclusions are drawn in light of the findings:

1. The elderly participants were able to familiarize themselves with the features of the game app and are very much willing to play it due to its impact on cognitive functioning.
2. The elderly participants and game developers acknowledged the very high usability of the game app.

Based on conclusions and suggestions of the participants, the following recommendations are now offered:

1. The use and play of the developed game app are highly encouraged among elderlies who can use

mobile phones upon considering the suggestions: some more enhancements on an interface, interaction, and feedback mechanism.

2. Testing the effectiveness of the game app to cognitive functioning is highly recommended.

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Parent-Child Communication and Psychological Well Being of Drug Users: Basis for Psycho-Spiritual Therapy

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Abstract

This study was conducted in order to determine the relationship of parent-child communication and psychological well-being of the respondents. Specifically, it sought to determine the level of parent-child communication and psychological well-being of the respondents; tested the significant difference between parent child communication and psychological well-being of the respondents when grouped according to age, sex, and educational background, number of siblings, religion, and work before, monthly family income, educational attainment, and job occupation; tested the significant relationship between parent-child communication and psychological well-being of the respondents and proposed a psycho-spiritual therapy to improve family relationships. Descriptive and correlational-development research design was employed involving 70 drug users in the Bureau of Jail Management and Penology one Province in MIMAROPA Region. Three standardized were used and data gathered were treated as instruments using different statistical tools. Results showed that the respondents find their parents as someone who can be leant upon and talked to about clarifications, God, financial matters and education. Respondents have the capacity to live a happy, satisfying and meaningful life, think of the family future, value family, want to grow and serve as provider. The study recommends constant communication between parents and child and a psycho-spiritual therapy that focuses on God, family values, personal growth and financial stability.

INTRODUCTION

Adolescence is the time in the life of a person where they begin to try and experiment on things especially with things regarded by many as problematic behavior. These behaviors include juvenile delinquency, substance abuse, antisocial behavior, poor school performance, aggressiveness, and intolerable actuations.

The Dangerous Drugs Board (2017) released the profile of drug abusers in the Philippines in 2016. Drug users are aged 31 years, single, and unemployed. The ratio of male to female is 13:1 while their educational attainment in college level of 27.14%. Majority of them have family income of around Php 13,000.00 and resides in urban localities. These users are specifically concentrated in the National Capital Region (NCR) and have been using drugs and similar substances. An average drug user has been taking it for an average of six (6) years.

The proliferation of drug abusers in the country has been rampant as the current administration launched its War on Drugs. For the last two years, there have been more than 4,000 drug-related deaths. Moreover, data from the Philippine Drug Enforcement Agency (PDEA) states that 11,132 out of 42,036 barangays in the country are drug-affected as of December 2015.

This paper presents concrete proof of the problems' existence in terms of parental communication and substance abuse. The recollection of the respondent's adolescent life and the status of their present communication to parents could be used as

reference point in the subsequent analysis. The results will serve as baseline data to present a psycho-spiritual therapy for the drug dependents.

OBJECTIVES OF THE STUDY

This study was conducted in order to determine the relationship of parent-child communication and psychological well-being of the respondents. Specifically, it sought to determine the level of parent-child communication and psychological well-being of the respondents; tested the significant difference between parent child communication and psychological well-being of the respondents when grouped according to age, sex, and educational background, number of siblings, religion, and work before, monthly family income, educational attainment, and job occupation; tested the significant relationship between parent-child communication and psychological well-being of the respondents and proposed a psycho-spiritual therapy to improve family relationships.

METHODOLOGY

This study used mixed method of research and intends to describe the extent of relationship between the parent-child communications and the respondent's psychological well-being. The descriptive part was used to gather information from the respondents through questionnaires while a semi-structured questionnaire was utilized to gather data that would validate the results of the study. In general, the study used a mixed method design that is both

quantitative and qualitative, sequential and explanatory. The respondents of this study were 70 drug users in the Bureau of Jail Management and Penology, coming from two Municipalities in the MIMAROPA Region who were chosen using complete enumeration. Majority of them are ranging from 31-40 years of age, males and college level with 4-6 siblings. Roman Catholics, unemployed with family income of below PhP 5, 000.00 and both parents were high school graduates managing their small businesses.

Parent-Child Communication Questionnaire (PCC). This was the tool used to identify respondent's parent-child communication. It is composed of 20 items. The parent-child communication scale (adapted from Bireda, 2013) measures and assess the child's perception of his level of communication with his father and mother.

Ryff's Psychological Well Being Scales (PWB). This was the test employed in order to determine drug-users psychological well-being. This is composed of 42 items with 6 dimensions such as Autonomy, Environmental Mastery, Personal Growth, Positive relations, Purpose in Life, and Self-Acceptance.

The interview gathered from the inmates were reorganized using thematic analysis to allow the researcher to compare similar responses and group contrasting ideas. From the analysis of the organized responses, the researcher was able to construct and develop a pattern of the emerging concepts.

RESULTS AND DISCUSSION

Table 1

	Father			Mother		
	WM	V I	Ran k	WM	V I	Ran k
1. I can discuss my beliefs with my father/mother without feeling restrained or embarrassed. (Nasasabi ko sa aking mga magulang ang aking paniniwala na hindi nahihya).	4.12	H	3	4.19	H	1
2. Sometimes I have trouble believing everything my father/ mother tells me. (Minsan nahihirapan akong paniwalaan ang lahat ng sinasabi ng aking magulang).	3.07	M	16	3.17	M	16
3. My father/mother is always a good listener. (Ang aking mga magulang ay isang mabuting tagapakinig)	4.06	H	4	4.06	H	3
4. I am sometimes afraid to ask my mother/father for what I want. (Minsan ako ay natatakot magtanong sa aking magulang).	3.04	M	18	3.10	M	18
5. My mother/father has a tendency to say things to me, which would be better left unsaid. (Ang aking mga magulang ay may mga sinasabi na mas mabuting hindi nalang sinabi).	3.07	M	17	3.16	M	17
6. My mother/father can tell how I am feeling without asking. (Nalalaman ng aking mga magulang ang aking nararamdaman kahit hindi nila ako tinanong).	3.74	H	12	3.67	H	13
7. I am very satisfied with how my mother/father and I talk together. (Nasisiyahan kontinto ako kapag naguusap kami ng aking magulang).	4.24	H	1	4.02	H	5
8. If I am in trouble, I can tell my mother/father. (Kapag ako ay may pinagdadaan, sinasabi koi to sa aking mga magulang).	3.93	H	9	3.74	H	10
9. I oftenly show affection to my mother/father. (Madalas kung pinapakita ang aking pagmamahal sa aking mga magulang).	4.15	H	2	4.14	H	2
10. When we are having a problem, I often give my mother/ father the silent treatment. (Kapag may problema kami madalas tahimik akong nakitungo sa aking mga magulang).	3.33	M	15	3.20	M	15
11. I am careful about what I say to my mother father. (Ako ay maingat sa sinasabi ko sa aking mga magulang).	3.89	H	10.5	3.80	H	7
12. When talking to my mother/ father, I have a tendency to say things that would be better left unsaid. (May mga pagkakataon na nasasabi ko sa aking mga magulang).	3.40	M	14	3.31	M	14
13. When I ask questions, I get honest answers from my mother/father.) (Sa tuwing nagtatanong ako sa aking mga magulang ay totoong kasagutan ang binibigay nila).	4.04	H	5	4.04	H	4

14. My mother/father tries to understand my point of view. (Nauunawaan ng aking mga magulang ang panananaw ko sa buhay).	3.95	H	7	3.68	H	12
15. There are topics I avoid discussing with my mother/father. (May mga bagay na iniwasan kung mapagusapan naming ng aking magulang).	3.68	H	13	3.71	H	11
16. I find it easy to discuss problems with my mother/father. (Nakikita kung madali lang sabihin sa aking mga magulang ang aking problema).	4.03	H	6	3.77	H	8.5
17. It is very easy for me to express all my true feelings to my mother/father. (Napakadali lang sa akin na ipakita ang aking totoong nararamdaman sa aking mga magulang).	3.89	H	10.5	3.82	H	6
18. My mother/father nags before me. (Ginugulo ako ng aking mga magulang).	3.95	H	8	3.77	H	8.5
19. My mother/father sometimes insults me when they are angry with me. (Nilalait ako ng aking mga magulang).	2.36	L	20	2.25	L	20
20. I don't think I can tell my mother/father how I really feel about some things. (Hindi ko maisip na kaya kung sabihin sa aking mga magulang ang aking nararamdaman tungkol sa mga bagaybagay).	2.96	M	19	2.88	M	19
Composite Mean	3.62	H		3.59	H	

Level of Parent –Child

Communication

Legend: 4.50 – 5.0 = Very High (VH); 3.50 – 4.49 = High (H); 2.50 – 3.49 = Moderate (M); 1.50 – 2.49 = Low (L); 1.00 – 1.49 = Very Low (VL)

Table 1 presents the level of parent-child communication of the respondents. In terms of their father, the communication is high on the following: “I am very satisfied with how my father/mother and I talk together” (4.24), “I often show my affection to my father/mother” (4.15), “I can discuss my beliefs with my father/mother without feeling restrained or embarrassed” (4.12), “My father/mother is always a good listener” (4.06), “When I ask questions, I get honest answers from my mother/father” (4.04) and “I find it easily to discuss problems with my mother/father” (4.03). However, the communication is low when they disagreed that “My mother/father sometimes insults me when they are angry with me” with a weighted mean of 2.36.

Table 2.

Emergence of the Theme of Open communication in the aspect Of parent-child communication

N = 70

Respondent	Transcripts	Emerging Concept	Sub-categories	Categories	Theme
2 & 3	“Talking to your loved ones alleviates the feelings” (Nagiging magaan ang iyong loob kapag may nakakausap ikaw na mahal mo sa buhay). and “The feeling is alleviated when you could clear things up with each other” (Gumagaan ang iyong pakiramdam kung ikaw ay may gustong linawin sa isat isa).	Feeling of relief when talking to a loved one	Measure the parent child openness in family communication and the extent of problems they both are encountering in their level of communication	Parent Child Communication	Open communication and
5 & 24	“Know what the child wants” (Malaman	Talking to child			

	ang gusto ng anak) and for both of them to “understand each other if they both want to know something” (Nagkakaentendehan kayo kung may gusto kang malaman).			
16, & 7	“Happy because he must learn to do good things” (Masaya sapagkat dapat matutong gumawa ng mabuti). “He is Separated with his parents early because of work” (Maaga akong nahiwalay sa aking magulang dahil sa trabaho). “He is separated with his parents early because of work” (Maaga akong nahiwalay sa aking magulang dahil sa trabaho).	Worry about the Future		
22 & 25	“Reminds the inmate not to forget God” (Pinaaalala na wag kalimutan ang Diyos). and talks about the “relation to God.” (Relasyon sa Dios)	Strengthen relationship with God		
	“Future of my kids, budget, future studies and business” (Nag aalala ako sa magiging kinabukasan ng aking mga anak, at gagastusin para sa kanilang pag-aaral at gayundin pagdating sa negosyo).	Worry about financial Matters		
21,26, &32	“Study diligently”, “finishing schooling,” (Makapag aral ng maayos). (Pagtapos sa pagaaral). “Study hard and fix his life” (Magaral ng mabuti at ayusin ang buhay). “Study, find job and do what is right” (Pag-aaral, hanapbuhay at tamang gawain).	The urge to get Education		
1,14,20 12 & 6,	“When there is only a problem, and only sometimes before meals” (Kapag may problema lang, minsan bago kumain). “Continuous. ‘(Tuloy tuloy) “If there is only a time,” (Kung may pagkakataon lang.) “My parents, we seldom see each other,” (Bihira kami magkita ng aking magulang) “if there is only family gatherings” (Kung may family gathering lang), and “if there is only important matter to be discussed” (Kung may importanteng bagay na pag uusapan).	Need to have more frequent conversation	The realization of the importance of family conversation	Results of the conversation
1,2,15,16, 31, 34, & 23,	“Happy because I’m given correct advice” (Natutuwa at napapayuhan ng tama). “Wrong doings are rectified” (Yong maling nagawa ay naitatama). “Happy because I’m guided to the right path” (Masaya dahil ginagabayan ako para sa tamang landas) and “happy because he must learn to do good things” (Masaya, sapagkat dapat matutong gumawa ng mabuti). “Happy just because he is given advise” (Natutuwa dahil pinapayuhan). “His future was talked and care about” (Napapagusapan kinabukasan ko). ”Happy and that the advice is good since the parent shows their love” (Masaya at maganda dahil nakita ko na mahal nila	Happy feelings when given advice by family		

	ako).			
	“Happy because I’m given correct advice” (Natutuwa at napapayuhan ng tama). “Wrong doings are rectified” (Yong maling nagawa ay naitama). “I’ve learned the right thing” (Natuto ako ng tama) and “I have corrected my wrongdoings” (Naitama ko ang maling gawa). “I followed their advices” (Sinusunod ko payo nila). “I wasn’t able to follow their advices” (Hindi kasi di ko nasunod ang payo nila). “I wasn’t able to do what they want for me” (Diko natupad ang gusto nila sa akin).	Result of the advice given		

Table 2 presents the emergence of the theme of Open Communication in the aspect of parent child Communication.

Some inmates mentioned that a financial matter is also one of their topics. Inmates also talked about getting education. Inmate 10 said that his family said he needs to “study diligently” (makapag- aral ng maayos). Inmate 21, likewise said that “pagtapos sa pag aaral (finishing schooling) is the dream of his family for him, inmate 26 narrated that his family requested to him to “Mag aral ng mabuti at ayusin ang buhay (study hard and fix his life) and inmate 32 was reminded by his family to “Pag-aaral, hanap buhay at tamang gawain” (Study, find job and do what is right).

The responses of the inmates which give rise to to the emerging concepts as indicated in Table 2 are the means for both parties to clarify things up, to know what the other party wants, worry about their future, strengthen their relationship with God, worry about financial matters, urge to get education, need to have more frequent conversation, have happy feelings when given advice by the family, and see the results of the given advice. This further resulted to sub-categories: for clarification, the need to secure the future and the realization of the importance of family conservation resulting to the categories: purpose of conversation with the loved ones, topics of the conversation and results of the conversation. Thus, the theme of open communication was developed.

Table 3.
Psychological Well-Being of the Respondents
 N=70

Dimensions of Psychological Well-Being	Mean	Verbal Interpretation	Rank
1. Purpose in life	4.66	High	1
2. Personal Growth	4.26	High	2
3. Positive Relations with others	4.18	High	3
4. Invironmental Mastery	3.99	High	4
5. Autonomy	3.87	High	5
6. Self-Acceptance	3.85	High	6
Composite Mean	4.14	High	

Leg

Legend: 3.50 – 6.00 = High ; 1.00 – 3.49 = Low

The Table 3 below shows that the respondents have generally high psychological well-being in all dimensions as evidenced by a composite mean of 4.14. Specifically, purpose in life (4.66) is high which implies that the respondents have a sense of direction and goals in life. They are able to find meaning in the present and past life. Furthermore, their life has its purpose which gives them reasons to live meaningfully. The personal growth (4.26) of the respondents is high which suggests that they are constantly developing, growing and expanding. They become open to new life’s experiences which can also contribute to their improvement within their self and even behavior. They also recognize their own

potentials and reflect more of their self-knowledge and effectiveness.

The autonomy dimension (3.87) shows that the respondents are self-determined and independent. They can be resistant to social pressures and can be able to regulate their own behavior from within. In like manner, they evaluate their own self based on personal standards and not dependent to other people’s evaluation. Self-acceptance (3.85) indicates that they possess positive attitude towards self. They are able to acknowledge and accept the multiple aspects of self, including the good and bad qualities which make them optimistic individuals.

Table 4
Emergence of the theme of family as confidant in the aspect of psychological well-being in terms of purpose in life
N = 70

	Transcripts	Emerging Concept	Sub-categories	Categories	Themes
8,7,10,6 & 51	<p>“Children, their future,”(Anak, kinabukasan nila), “To give and help my family and myself,”(Para mabigyan at matulungan ko ang pamilya at sarili ko) “Parents and children,”(Magulang at anak) “Why I am here well in fact I am the one who is supposed to guide my family.” (Bakit ako ay narito na dapat ako ay gumagabay sa pamilya.)</p>	<p>Purpose to have better future of the family, looking at himself as a good father and provider for the family</p>	<p>Has goal in life and sense of direction; feels there is meaning to present and fast life; holds beliefs that give life purpose; has aims and objectives for living.</p>	Purpose in life	Family as confidant and Psychological well-being
3,4,11, &37	<p>“Good father and a model husband,” (Mabuting ama o huwaran at asawa.) “To be free and work for my children,” (Makalaya at makatrabaho para sa mga bata). “Not just for myself but for my children.” (Hindi lang sa sarili kundi sa aking mga anak.)</p>				

69, 70,4,19, 22,44 & 45	<p>“No, because I could not help my family,” (Hinde dahil di ako nakaktulong sa pamilya.) “No, because I am just a bum. I don’t have a work to earn for me to be able to help.” (Hinde dahil pakainin ako Wlang trabahong pinagkikitaan para maitulong ko.) “Yes I was able to share the word of god and was able to pray. (yes,natuto akong magshare ng word of God at manalangin) “Yes, because I am helping my friends and family. (Opo kasi tumulong sa pamilya.” Yes because I ‘m earning a living and enjoying it. Opo, dahil kumita at nalilibang. “Yes, because I am strengthened and renewed that I could be with my family again. (Opo, kasi nagkaroon ako ng lakas ng loob makasama uli ang aking pamilya.) “Yes for the people who rely on me that I could provide them with a good future. (Opo, para sa taong umaasa sa akin na mabigyan ko sila ng magandang kinabukasan.)</p>				
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Here are the responses given by the inmates:
 Personal growth psychological well-being dimension of the inmates is ranked second. The inmates believe that personal growth is somehow crucial to their daily living and it can affect their life as a whole. Respondents should therefore be continuously reminded of the importance of personal growth to them as a person. Inculcating into the minds of the inmates that personal growth is important is imperative at this point.

The responses of the inmates indicated in Table 4 led to the emerging concepts such as the the sense of purpose towards a better future of the family --the purpose of having a new life for them to be better fathers and husbands, and to be better providers to the family. This further resulted to two sub-categories: family as the most important aspect of their life and the purpose of providing for the family. This falls under the category: purpose in life. Hence, the theme of family as confidant was developed.

Table 5
Emergence of the theme of new learning to improve in the aspect of psychological well-being in terms of personal growth
 N = 70

	Specific Responses	Emerging Concept	Sub-categories	Categories	Themes
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28,37,38, &42	I am still inside the prison.” (Nasa piitan pa nga ako.)	The prison is a hindrance to grow	Has a feeling of continued development; sees self as growing and expanding; is open to a new experiences; has a sense of realizing one’s potential; sees improvement in self and behavior overtime; is changing in ways that reflect more self-knowledge and effectiveness.	Personal Growth	New learning to improve/Psychological Well Being
3,19 &56	“I am not friendly,” (Di ako palakaibigan) and “Because I am not friendly.”Kasi di ako palakaibigan.) “Like being friendly,” (Gaya ng pakikipagkaibigan.)				
All except 40, 67 & 68	“Yes, I allot time to learn new things.” (Oo, naglalaan ako na oras upang matuto ng mga bagong bagay.)	They have interest to learn more			
All except 40	“Yes, I am open to learn new things.” (Oo, bukas ako na matuto ng mga bagong bagay.)				

Table 5 shows the emergence of the theme of new learning to improve in the aspect of psychological well-being in terms of personal growth. To further support the findings and clarify what new experiences the inmates wanted and needed, the results of the interview are presented below. For Personal Growth, the inmates were asked if they are interested to do things that could enhance their knowledge and capabilities. All respondents said yes except Inmate 40: “Narito pa ako sa loob ng piitan, paglabas siguro” (I am still inside this prison, maybe when I am free). Inmates were also asked if they improved as individuals. Majority agreed that they do improve. Only inmates 28, 37, 38 and 42 answered otherwise, stating that they are still inside the prison: (“Nasa piitan pa nga ako” (I am still inside the prison). Inmates 3, 19 and 56, on the other hand state that they did not improve because they are not friendly: “Di ako palakaibigan” (I am not friendly); “Kasi di ako friendly” (Because I am not

friendly). “Gaya ng pakikipagkaibigan” (Like being friendly). When the inmates were whether they are in favor of doing things that they are not used to, 25 out of 70 inmates expressed discontent. The rest agreed that they are in favor. Inmate 22 said that “May mga bagay na ayaw mong gawin pero kailangan” (There are things that you don’t want to do but you have to). Inmate 53 even said that he would do things that he is not used to. “Kung kinakailangan” (It is needed), he said. When asked if they allot time to learn new things, only inmates 40, 67 and 68 said “No”. The responses of the inmates indicated in Table 5 resulted to the emerging concepts such as the prison is a hindrance to grow, they allot time to learn new things, and open to learn new things. This resulted to two sub-categories: low self-worth and high hopes to learn resulting to the category, personal growth. Hence, the theme new learning to improve was developed.

Table 6
Emergence of the theme of family as core source of strength in the aspect of psychological well-being in terms of positive relations with others
 N=70

	Transcripts	Emerging Concept	Sub-categories	Categories	Themes
6,1, 21, 22,2 7 & 32	“Kind and loving to a wife and understanding,” (Mabait, mapagmahal sa asawa at maunawain.) “Like in a family we are working together,” (Kagaya sa pamilya kami ay nagkakaisa.) “We have a good relationship in our family,” (Magkakasundo naman kami sa pamilya.) “A caring son to the family,” (Maalalahaning anak sa pamilya.) “Considers a friend as a family” (Tinuturing na kapamilya ang kaibigan.) and “I am loving because my parents taught me.”(Mapagmahal ako dahil tinuro ito ng magulang ko.)	Family serves as the core source of strength and valuing of the inmates	Has warm satisfying trusting relationship with others; is concerned about the welfare of others; capable of strong empathy, affection, and intimacy; understands give and take of human relationships.	Category 3: Positive Relations with others	Family as core source of strength / Psychological Well-Being
7,15, 28,3 3,34, 44,6 6,& 8	“I can feel that they love me,” (Naramdaman kung mahal nila ako.) “Their presence alleviates the weight that I harbor inside of me,” (Nakakabawas ng bigat ng saloobin.) “Sadness and longing were gone,” (Nawawala ang lungkot at pangungulila.) “I no longer worry about their well-being,” (Nawala yong pagalala ko sa kanila.) “I am so happy because I got my strength from them.”(Sobrang saya, kasi sa kanila ako humuhugot ng lakas.) “I am excited because I also miss them” (Excited dahil namimiss ko din.) and “I’m so happy being able to embrace them again.”(Napakasaya ko dahil nakayakap ko uli sila.) “I can express what I feel inside.” (Naiilabas ko ang saloobin ko.)				

Table 6 shows the emergence of the theme of family as core source of strength under psychological well-being in relation to their positive relations with others. The positive relationship dimension of the psychological well-being of the inmate is high and ranked third. To further determine the reason for this high score, the inmates were asked if other people see them as a loving person, only 9 inmates out of 70 said “no”. When asked if they are having a hard time building

a relationship, 38 inmates out of 70 said “no”, citing the family and the concept of a family as their strong points. The responses of the inmates indicated in Table 6 resulted to the emerging concepts suchlike the family serves as core source of strength and valuing of the inmates as well as they are loving persons. From these concepts two sub-categories sprang like family values and thoughts of the family resulting to the category, positive relations with others. As a result, the family as a core source of strength was developed.

Table 7
Emergence of the theme of obligation as provider in the aspect of psychological well-being in terms of environmental mastery N=70

	Transcripts	Emerging Concept	Sub-categories	Categories
4,5,31 & 34	“Because I was imprisoned in this cell.”(Dahil ako ay napasok sa piitan.) “Because I am inside this	Discontentment because of imprisonment	Has a sense of mastery and competence in managing the environment; controls complex array of external activities; makes	4. Environmental Mastery

	<p>prison,” (Dahil narito ako sa piitan). “Because of this trial that was given to me.”(Dahil sa pagsubok na binigay.) and “My being in prison. I have a hard life.”(Pagkakulong ko, napakahirap ang naranasan sa buhay.)</p> <p>“I can face what is happening to me right now because of God.”(Kaya ko naman harapin ang naranasan ko dahil sa Diyos.)</p>		<p>effective use of surrounding opportunities; able to choice or create contexts suitable to personal needs and values.</p>	
39, 46, & 42	<p>“My situation now is not good,” (Di mabuti kalagayan ko ngayon.) “I am not free, I could not do what I want,” (Di ako Malaya Diko magawa gusto.) and “I am still imprisoned, maybe if I’m free I’ll be contented.”(Dito ako sa piitan, siguro pag Malaya na kontento.)</p>			
35, 2, 18, 15, 11, 45 and 52	<p>“It is hard in here, I don’t see my family. (Mahirap dito diko nakikita ang pamilya.) “I am longing for the love of my beloved family, “(Nangungulila ng pagmamahal ng mahal sa buhay.), It is very hard in here,my family is away. (Napakahirap dito malayo sa pamilya.) ‘I ‘m inside this cell, I could not provide for them,” (Dito ako sa loob diko magawa obligasyon ko sa pamilya) “I am not with my wife and kids and my parents. “(Diko kasama ang aking magina at aking magulang), “I wasn’t able to keep track of my childs life. (Di ko nasusubaybayan ang takbo ng buhay ng anak.), “I have a family to support financially, (May pamilya ako na dapat sustintuhan.)</p>	<p>Discontentment because of being away from family</p>		

Table 7 shows the emergence of the theme of obligation as provider in the aspect of psychological well-being in terms of environmental mastery. The environmental mastery dimension of the inmates’ psychological well-being is high

and ranked fourth. To further determine the reason for this high score, the inmates were asked if they are having difficulty facing challenges in life. Most disclosed that they are having difficulty.

“Dahil ako ay napasok dito sa piitan. (Inmate 4)” (Because I was imprisoned in this cell.)
 “Dahil narito ako sa piitan (inmate 5)” (Because I am inside this prison.)
 “Dahil sa pagsubok na binigay. (Inmate 31)” (Because of this trial that was given to me.)
 “Pagkakulong ko, napakahirap ang naransan sa buhay.” (Inmate 34) (My being in prison. I have a hard life.)
 Inmate 16 reasoned that he could easily associate with fellow inmates because he is “mapagkaibigan at masayahing tao” (friendly, gleeful and a good-humored person).
 Inmates 37 and 41, however, cited personal reasons of their being friendly with fellow inmates: “Dahil kailangan ko sila” (Because I need them) and “Kailangang makisalamuha dahil sa depression at stress” (I need to mingle with them because of depression and stress).
 Meanwhile, there were some inmates who showed distrust to their fellow inmates. The following are their reasons: “Kasi ang tao kahit mabait ka tinitira ka patalikod” (Though you are good hearted and kind, still other people talk behind your back), said Inmate 62. “Sila ay mayabang at mahirap pakisamahan” (They are boastful, and very hard to mingle

with), said Inmate 63. “Hindi, dahil pakiramdam ko di sila mapapagtiwalaan” (No, because I fell it’s hard to trust them), said Inmate 68. “Hindi, kahinahinala ang kilos minsan” (No, there are times that they act suspicious),” answered Inmate 69.
 The researchers determined in their study whether wellness is equivalent to happiness or not. They tested if the psychological well-being of an individual helps him in addressing the changing environment, and live in harmony. They found out that the affective side of an individual is greatly related to the psychological well-being and harmony in life. This implies that if the inmate is loving and affectionate despite the environment of the prison at the situation of everyday life, he is able to use any opportunity available to him as provided by the situation and immediate environment, and to master his environment.
 The inmates believe that socializing with people is important to their life as a person. The results mean that while others’ view on them is positive, they often get downcast on their everyday living even if they have a good camaraderie with people. This means that they have a mastery of their environment.

Table 8
Emergence of the theme of resisting social pressures in the aspect of psychological well-being in terms of autonomy

	Transcripts	Emerging Concept	Sub-categories	Code	The
4,23, 24,27, 42,5 5, 58 &62	“I accept others opinion although it’s opposite to mine” (Tinatanggap ko opinion nila kahit salungat sa opinyon ko.) and “I would agree with their opinion.”(Makikiayon ako sa opinion nila.)	Conform and resist to social pressures	Self-determining and independent; able to resist social pressure to think and act in a certain ways; regulates behavior from within; evaluates self by personal standards.	5. Autonomy	Resisting social pressures/Psychological Well-being
	“I don’t follow their opinion. Only my own”, (Di sinusunod Openyon ng iba. Sarili lang.) “Because I have my own opinion,” (Kasi may sarili ako opinion.) “It’s okay, I listened but I don’t follow their opinions,” (Okey lang nakikinig lang ako, pero diko sinusunod.) “I am not listening to them, their opinions are not beneficial” (Di ko pinakikingan, d naman nakakabuti opinion nila.), and “They are free to voice out their opinion but I’ll follow my own opinion because I know that it is beneficial for me.”(Malaya silang magpahayag ng opinion pero susundin ko ang opinion ko na alam kong makakabuti sa akin.)				
16, and 34	“Because if the family is affected especially if what others are thinking is not true” (Dahil kung pamilya apektado lalo kung hinde totoo.) and “It is important for me because I love my family.”(Importante sa akin mahal ako ng pamilya ko.)				

N=70

Table 8 shows the emergence of the theme of resisting social pressures in the aspect of psychological well-being in terms of autonomy. The autonomy dimension of the inmates' psychological well-being is high and ranked fifth. To further show the reason for the inmates' ability in his mastery of resisting social pressures, the following questions were asked: In relation to their psychological well-being under autonomy, when asked on how they react when others' opinion is opposite and outright different from their own, Inmates 4, 23, 24, 27, 42, 55, 58 and 62 expressed their agreement to the opposing opinion citing the following sample statements: "Tinatanggap ko ang opinyon nila kahit salungat sa opinyon ko" (I accept others opinion although its opposite to mine) and "Makikiayon ako sa opinyon nila" (I would agree with their opinion).

This shows that some inmates scored low in their autonomy since they of fellow inmates and rely on their judgments. Allen and Loeb (2015) stated that to be successful in dealing with peers, anyone must need to manage the challenge and be

autonomous in their communications with their peers. The capacity of a person in achieving autonomy and connection can be developed better within and outside their family in their interaction with adults.

When asked if they are having a hard time making decisions for them, majority of the responded blurted that they are of right age and already knows right from wrong: "Marunong ako magdesisyon" (I know how to decide for myself), said inmate 31, "Marunong akong mag isip ng tamang desisyon" (I know how to decide correctly), said Inmate 40 and "Ako magdedesisyon sa sarili ko" (I will decide for myself), said Inmate 52. β

The responses of the inmates presented in Table 8 resulted to the emerging concepts like conform to social pressures, resist social pressures independence and concern for family resulting to sub-categories social pressure as part of life and social pressure and family which further led to the category of autonomy. Thus, the theme resisting social pressures was developed.

Table 9

Emergence of the theme of faith and family love in the aspect of psychological well-being in terms of self-acceptance
 N=70

Respondent Numbers	Transcripts	Emerging Concept	Sub-categories	Categories	Themes
38, 40 & 42	"I am away from my family," (Hindi po kasi malayo ako sa aking pamilya.) "Not happy because they are imprisoned." (Hindi po masaya kasi nasa piitan pa po ako.)	Happiness is being with family	Possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self; including good and bad qualities; feels positive about past life.	6. Self-Acceptance	Faith and family love/psychological Well Being
61,62,63 & 65	"Yes, because there is no hope," (Opo dahil parang wala ng pagasa). "Yes, because of my long stay here still I am not freed," (Opo dahil sa tagal ko na ditto wala parin.) "Yes, there are times that I think there is no chance anymore," Opo, minsan nasasagi sa isip nawala ng padasa. and "Yes, because I have been imprisoned for too long." (Opo, dahil matagal na ako dto.)	Hopeless because of being imprisoned			
4 and 36	"Yes, believe in the Lord," (Oo, magtiwala sa Dios.) and "Yes, I will endure all because of my faith in God." (Opo, kakayanin ko ang lahat sa pananalig sa Diyos.)	God as source of strength			

Table 9 shows the emergence of the theme of faith and family love in the aspect of psychological well-being in terms of self-acceptance. The self-acceptance of the inmates' psychological well-being is high and ranked sixth. To further determine the result, the inmates were probed with the following questions: for self-acceptance, when asked if they

are happy with their life, 22 out of 70 inmates answered that they were not. Inmate 38 explained that he is not happy since "Hindi po kasi malayo ako sa aking pamilya." (I am away from my family). Inmate 40 and 42 added that they are "Hindi po masaya kasi nasa piitan pa po ako" (Not happy because they are imprisoned).

The responses of the inmates presented in Table 9 resulted to the emerging concepts parallel to happiness is being with family, hopeless because of being imprisoned and God as source of strength. From these concepts, frustration about

current status and positivity because of faith as sub-categories emanated. This in turn ensued to the category, self-acceptance, from which the theme faith and family love was developed.

Table 10
Test on significant difference between parent child communication of the respondents when grouped according to demographic profile

Sex						
Source of Variation	Sum of Squares	df	Mean Squares	Computed F	Tabular F	
					1%	5%
Between Groups	1.21	3	0.4019	0.00046	4.13	2.76
Within Groups	48813.89	56	871.78			
Total	48815.09	59				
Age						
Between Groups	2.336	3	4.992	0.0038	4.13	2.76
Within Groups	48.940	56	78.761			
Total	51.276	59				
Educational Background						
Between groups	3.6	3	1.2	0.693	4.13	2.76
Within Groups	97.04	56	1.733			
Total	100.64	59				
Number of Siblings						
Between Groups	6.243	3	2.081	2.081	4.13	2.76
Within Groups	56	56	1			
Total	62.243	59				
Religion						
Between Groups	5.343	3	1.073	1.073	4.13	2.76
Within Groups	47.91	56	1			
Total	53.233	59				
Work Before						
Between Groups	2.759	3	3.992	3.992	4.13	2.76
Within Groups	30	56	1			
Total	32.759	59				
Monthly Family Income						
Between Groups	16.443	3	2.501	2.501	4.13	2.76
Within Groups	56	56	1			
Total	72.443	59				
Educational Attainment						
Between Groups	3.354	3	0.061	0.061	4.13	2.76
Within Groups	36	56	1			
Total	39.354	59				
Job Occupation						
Between Groups	7.639	3	2.081	2.081	4.13	2.76
Within Groups	56	56	1			
Total	63.639	59				

As shown in the table above, the computed f values for all demographic profiles are all less than the tabular F values at 1% and 5%, level of significance. The null hypothesis is thus accepted. There is no significant difference on the parent-child communication of the respondents when

grouped across demographic profile such as sex, age, and educational background, number of siblings, religion, and work before, monthly family income, educational attainment, and job occupation.

Table 11

Test on significant difference between psychological well-being of the respondents when grouped according to demographic profile

Sex						
Source of Variation	Sum of Squares	df	Mean Squares	Computed F	Tabular F	
					1%	5%
Between Groups	2.66	3	0.3006	0.0051	4.13	2.76
Within Groups	11.76	56	7.48			
Total		59				
Age						
Between Groups	0.388	3	5.003	0.0039	4.13	2.76
Within Groups	44.184	56	78.7008			
Total	44.572	59				
Educational Background						
Between groups	2.05	3	1.21	0.7	4.13	2.76
Within Groups	66.107	56	1.699			
Total	68.107	59				
Number of Siblings						
Between Groups	1.046	3	2.982	2.085	4.13	2.76
Within Groups	56.01	56	1.05			
Total	57.056	59				
Religion						
Between Groups	5.351	3	1.053	1.074	4.13	2.76
Within Groups	48	56	1			
Total	53.351	59				
Work Before						
Between Groups	2.806	3	4.003	3.994	4.13	2.76
Within Groups	30	56	1			
Total	32.806	59				
Monthly Family Income						
Between Groups	16.242	3	2.51	2.51	4.13	2.76
Within Groups	57.502	56	1			
Total	73.744	59				
Educational Attainment						
Between Groups	3.446	3	0.0625	0.062	4.13	2.76
Within Groups	35.578	56	1			
Total	39.024	59				
Job Occupation						
Between Groups	7.703	3	2.082	2.082	4.13	2.76
Within Groups	55.998	56	1			
Total	63.701	59				

As shown in table above, the computed f values for all demographic profiles are all less than the tabular F values at 1% and 5%, level of significance. The null hypothesis is thus accepted. There is no significant difference on the psychological well-being of the respondents when grouped across demographic profile such as sex, age, and educational

background, number of siblings, religion, and work before, monthly family income, educational attainment and job occupation.

Table 12

Relationship between Parents – Child Communication and Psychological Well-Being

	Mother			Father		
	r-value	p-value	I	r-value	p-value	I
Autonomy	0.156	0.206	NS	0.131	0.295	NS
Environmental Mastery	0.003	0.983	NS	-0.053	0.671	NS

Positive Relations	0.139	0.262	NS	0.145	0.247	NS
Purpose in Life	-0.045	0.717	NS	-0.006	0.963	NS
Self-Acceptance	0.110	0.376	NS	0.139	0.267	NS
Personal	0.143	0.249	NS	0.113	0.368	NS

Legend: Significant at p-value < 0.05; NS = Not Significant
 Table 12 presents the relationship between parent-child communication and psychological well-being. It was observed from the table that the computed r-values indicate an almost negligible correlation and the resulted p-values were all greater than 0.05 alpha level. This means that there was no significant relationship existed and implies that the respondents' well-being is not affected by the parent-adolescent communication and vice versa. This means that the psychological well-being of the respondents, especially the dimensions, does not have a connection with parent-child communication. No amount of constant connection with parents can predict the psychological well-being of the respondents. The effect of environment to the personality of the person is very crucial. The respondent may be exposed to a positive home environment but may be exposed to degrading environment outside the house. In the case of the inmates, their exposure is limited to the confines of their prison cell and the activities provided to them by the prison administration.

CONCLUSIONS

1. Constant communication between parents and child should be permanently established. This will pave the way to discuss matters which were left unsaid.
2. There is a need to sustain high level of psychological well-being of the respondents through a psycho-spiritual therapy that focuses on God, family values, personal growth and financial stability.
3. Other variables may be tried to correlate with the psychological well-being of the respondents in order to establish data on it.
4. The proposed psycho-spiritual therapy may be tried to test its effectiveness.

RECOMMENDATIONS

1. Respondents find their parents as someone who can be leant upon at all times. They are someone who can talk to whenever problems arise. They talk about clarifications, god, financial matters and education.
2. Inmates have the capacity to live a happy, satisfying and meaningful life. They think of the future of their family, they want to grow, they value family and they want to provide for them.
3. Psychological well-being of the respondents does not depend on the parent-child communication. There might be other variables that may affect psychological well-being of the inmates.
4. proposed Psycho-spiritual Therapy Program

Proposed Psycho-Spiritual Therapy Program

Therapy Goal: To enhance psycho-spiritual wellness via parent-child communication on the following dimensions: autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance.

Topic 1 – AUTONOMY VIA DIFFERENTIATION OF SELF

Objective: To enable each participant to differentiate themselves intrapersonally and interpersonally.

Strategies:

- A. Taking the Differentiation of Self Test. By way of this test, the counselor would be able to determine how differentiated and autonomous the participants prior to the psycho-spiritual therapy program.
- B. Group Process. The counselor shall conduct a group process by way of a two-phase interaction. Phase 1 is a question-and-answer study on “how differentiated Jesus is from God the Father, and vice versa,” based on the following texts: John 5:17, 19-20, 26, 22-23; John 10:15, 17. To what extent are the following characteristics of a differentiated person manifested by Jesus?

Intrapersonally,

1. He is ruled by his intellect vs. feelings
2. He is proactive vs. defensive.
3. He is inner-directed (meaning his actions are directed by his own values and belief systems) vs. other-directed (meaning his actions are directed by the values and beliefs systems of other people).

Interpersonally

1. He defines his own identity apart from others vs. being fused to others.
2. He uses the “I-language” vs. “we-language.”
3. He observes a clear boundary system vs. diffused boundary fusing himself to others for the sake of togetherness.

Phase 2 is a personal reflection based on the following scaling questions:

1. In a scale of 1 to 10, where 1 signifies complete fusion and 10 complete differentiation of self or autonomy, where are you now?
2. In a scale of 1 to 10, where do you want to be? To reach that scale, what would you be doing differently?

Success Indicators:

1. In the succeeding Differentiation of Self Test, the participant's scores shall be at the median level or higher.
2. Using his intellect, he becomes more proactive than reactive, uses the I-language, and observes boundary system between himself and others thus avoiding being triangulated or drawn towards coalition with a third party.

Topic 2 – ENVIRONMENTAL MASTERY

Objective: To create a deeper sense of awareness and responsibility as a steward of one’s immediate environment.

Strategies:

- A. Biblical Reflection -- Imagine how Adam and Eve fulfilled the roles and responsibilities that God placed on them from Creation. Psalm 8:4-8; Genesis 1:26-28; chapter 2 & 3.
 1. What was God’s original purpose for creating Adam and Eve?
 2. In relation to their Edenic environment, how did God define their roles and responsibilities?
 3. After the Fall, what happened to their home environment? How is it compared to our present living environment?
 4. In a scale of 1 to 10, where 1 stands for the very weak resilience and not able to cope with environmental challenges and 10 for its strongest level of resilience, where are you now?
 5. In the same scale, where do you want to be? How would you be more resilient to reach that level?
- B. Group Process -- focused on how to be more resilient bouncing back and moving on after some tragedies or any life’s challenges.

Success Indicators:

1. Higher level of resilience in a scaling method
2. Testimonies on how each one bounces back and moves on with his life.

Topic 3: PERSONAL GROWTH

Objective: To empower the participants to be more open to new experiences resolving his impasse once and for all.

Strategies:

- A. Object Lesson – Peeling of onions layer by layer to represent the layers of neurosis:
 - 1st Layer -- Phony layer (dead self—in view of the social masks to hide the “dark side”)
 - 2nd layer – Phobic layer (growth of self is hampered by a no. of fears)
 - 3rd layer – IMPASSE (stuckness)
 - 4th layer – Implosive (working through one issue at a time)
 - 5th layer – Explosive (being alive thriving while bringing closure to a no. of issues)
- B. Group Process:
 1. Which layer of neurosis are you now? Please explain.
 2. From that layer where do you want to be? For you to reach that layer, what would you be doing differently as a sign of your personal growth?
 3. Personal reflection: As our greatest model, how was Jesus’ personal growth described in Luke 2:52? Which of the four dimensions of growth (physical, social, mental, and spiritual) you need to grow more? If you were to illustrate each dimension in a scale of 1 to 10, where are

you now? In that scale, where do you want to be physically, socially, mentally, and spiritually?

Success Indicators:

1. The participant has resolved his impasse and moved towards 4th or 5th layer.
2. The participant has reached 5 or beyond in a scale of 1 to 10 in his physical, social, mental, and spiritual growth.

Topic 4: POSITIVE RELATIONS

Objective: To cultivate a spirit of social interest to fellowmen regardless of one’s station in life, religion, and cultural tribe.

Strategies:

- A. Biblical Reflection – Analyze the various characters and plots involved in Jesus’ parable of the good Samaritan (Luke 10:25-37). Think of a similar situation that may be related to this event – how it happened, who were involved, and what was the ending.
- B. Group Process:
 1. What are the different kinds of personality involved in this parable? Describe each personality.
 2. Take note of the following characters’ philosophy of life:
 - (a) Robber – “What is mine is mine, I’ll keep it. But what is yours is also mine, I’ll take it.”
 - (b) Priest & Levite – “What is mine is mine. And what is yours is yours. Let us just keep it to ourselves, for we have nothing to do with one another.”
 - (c) Good Samaritan – “What is yours is mine, and what is mine is yours. Let us share it with one another.”
 3. Whose philosophy of life is yours? In what way can you relate dealing with such kinds of personality and their respective philosophies of life?
 4. What insight have you gained from our study? In a scale of 0 to 10 where 0 means no commitment at all and 10 is full and complete commitment, to what extent do you commit yourself to have positive relations with others?

Success Indicators

1. A scale of 6 or higher level of commitment is indicated by the participants.
2. A helping behavioral act manifested towards one fellowman in a day.

Topic 5: PURPOSE IN LIFE

Objective: To define what makes life purposive and worth living.

Strategies:

- A. Bible Reflection – Picture in your mind what the Apostle Paul, in his letter to the young Timothy, described here: ^{ln} a wealthy home some utensils are made of gold and silver, and some are made of wood

and clay. The expensive utensils are used for special occasions, and the cheap ones are for everyday use. If you keep yourself pure, you will be a special utensil for honorable use. Your life will be clean, and you will be ready for the Master to use you for every good work.” 2 Timothy 2:20-21 (NLT)

B. Group Process:

1. What are the various utensils can you find at home? What are they made of?

For what purpose each utensil was made?

2. Choose a utensil to represent yourself and your purpose in life. Explain your symbolic utensil and the reason why you have chosen it.
3. If you were to choose another utensil to combine with your first choice, what would it be? Explain.
4. Consider now Jesus’ purpose in life: “For even the Son of Man came not to be served but to serve others and to give his life as a ransom for many.” Matthew 20:28 (NLT)
5. In a scale of 0 to 10, where 0 represents no purpose in life at all, and 10 for being like Jesus in defining and living completely His purpose in life, where do you stand now? In the same scale, where do you want to be, and what would you be doing differently to reach that scale?

Success Indicators

1. Identify clearly his symbolic utensil and its purpose or functions.
2. A scale of 5 or higher to represent his level of living a purposive life.

Topic 6: SELF-ACCEPTANCE

Objective: To enhance the ability to accept self completely and joyfully.

Strategies:

- A. Bible Reflection – Picture clearly the setting of this story and those involved in it as recorded in John 8:1-11.

Jesus returned to the Mount of Olives, but early the next morning he was back again at the Temple. A crowd soon gathered, and he sat down and taught them. As he was speaking, the teachers of religious law and the Pharisees brought a woman who had been caught in the act of adultery. They put her in front of the crowd.

“Teacher,” they said to Jesus, “this woman was caught in the act of adultery. The law of Moses says to stone her. What do you say?” They were trying to trap him into saying something they could use against him, but Jesus stooped down and wrote in the dust with his finger. They kept demanding an answer, so he stood up again and said, “All right, but let the one who has never sinned throw the first stone!” Then he stooped down again and wrote in the dust.

When the accusers heard this, they slipped away one by one, beginning with the oldest, until only Jesus was left in the middle of the crowd with the woman.

Then Jesus stood up again and said to the woman, “Where are your accusers? Didn’t even one of them condemn you?” “No, Lord,” she said.

And Jesus said, “Neither do I. Go and sin no more.” John 8:1-11 (NLT)

B. Group Process:

1. In your own words, picture the incident that John narrated in the text.
2. If this is a court setting, who are the various characters: judge, accusers, the accused, witnesses, the defense counsel? Describe each character.
3. What was the woman’s case? Was she guilty or not guilty? If guilty, did she deserve to be punished by death through stoning?
4. What could be the thoughts and feelings of the woman while she was being accused in front of the public?
5. How did Jesus treat the woman’s case? Describe the character of Jesus as He addressed the accusers and the woman.
6. In the light of the way Jesus treated the woman, how should she reflect such attitude of Jesus towards herself?
7. In what way can you relate yourself to the woman? In a scale of 0 to 10 where 0 stands for non-acceptance of self and 10 for full and complete self-acceptance, to what extent have you accepted yourself as you are and what you can be by God’s help?

Success Indicators:

1. A scale of 6 or higher level of self-acceptance.
2. A manifestation of unconditional positive regards towards others.

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Perceptual Mapping using Correspondence Analysis of Multi Brand Multi Product E-Commerce Websites Based on Online Visual Merchandising Elements: An Empirical Study among Generation X, Generation Y, Generation Z

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Abstract

E-commerce volumes vary severely across countries due to covid 19 pandemic. With the growth in internet and online infrastructure in India, e-commerce industry has gained a great relevance today. Government policies had given a great amount of strength to this industry. It is of great relevance today to study E-Commerce industry and factors that help to increase sales in the industry. From previous researches it is very much clear that there are certain online visual merchandising elements that actually influence the customers to either visit or purchase from online websites. The study helps to understand how different generations perceive various online visual merchandising elements and how they are associating these elements to different online websites. The online visual merchandising elements used in the study is layout and design, Navigation, Product presentation, Product view dimensionality, product information, customer service and atmospherics. The E-Commerce websites used for the study are Multibranded Multiproduct websites namely, Amazon, Flipkart, Snapdeal, Meesho and Tatacliq. The study is conducted among three generations and the tool used for perceptual mapping in the study is Correspondence analysis.

Index Terms

Correspondence analysis, Generations, Multibranded Multiproduct e-commerce websites, Online Visual Merchandising Elements.

I. INTRODUCTION

As we are on the road of recovery from COVID 19 pandemic-Commerce industry is surely going to boom. India's e-commerce penetration is expected to double to 11% by 2024. E-retail will gain millions of customers across India, due to increase in merchandise choice and internet usage rate. Internet usage rate in India has gone up to 45% in 2021. In this context the study of different-commerce websites is of absolute importance. The current study understands the various e-commerce website based on online visual merchandising elements. The rationale behind this study understands the perception of different generations on different e-commerce websites based on online visual merchandising elements. The study uses seven online visual merchandising elements namely:-layout and design, navigation, product presentation, Product view dimensionality, product information, customer service and atmospherics. Five e-commerce websites are considered in

the study. They are amazon, flipkart, snap deal, meesho and tatacliq. The study is conducted among the three generations: -Gen X, Gen Y, and Gen Z in Kerala.

II. MULTI BRAND MULTI PRODUCT E-COMMERCE WEBSITES

E-commerce (electronic commerce) refers to the purchasing and selling of goods and services, as well as the transmission of payments and data, over an electronic network, most commonly the internet. E-commerce is a website that allows users to buy and sell physical items, services, and digital products online rather than at a physical store. A business can handle orders, receive payments, manage shipping and logistics, and provide customer care through an e-commerce website. There are e-commerce websites which presents products endorsed by different brands and merchandises a wide variety of products providing customers with wider choice. Such e-commerce websites for the purpose of this

study is defined as multi Brand multi Product e-commerce websites.

III. Literature Review

For the purpose of the study the literature review is divided into three parts. The first part will have a detailed literature on various online visual merchandising elements used in the study. The second part will be dealing with the different generations and the third will be on different multibranded multiproduct e-commerce websites.

1.1. Online Visual Merchandising Elements

According to (Lea-Greenwood, 1998) visual merchandising is one of the most important tool attracting consumers to browse through e-commerce websites and make them purchase. Visual merchandising (VMD) is the tactical exhibition of products to appeal consumers and enable purchase (Diamond & Diamond, 2007). According to Colborne (1996), different types of stores will be having different visual merchandising techniques. These techniques are mainly used to increase sales. (Lee et al., 2010) in their research paper explained the relevance of online visual merchandising elements in creating an attractive website environment. In this study the researcher is considering seven online visual merchandising .A detailed literature on each elements is given below.

The **layout and design** of every online website has its own relevance in creating a positive influence on every customer Blázquez, M. (2014) in his research paper emphasized the importance of layout and design. (Allen, 2000) said that information about the different products available in e-commerce website can be better understood with the help of a proper layout and design. Dahan and Srinivasan (2000) suggested that like in-store layout and design online store layout and design also have its own relevance in buying behaviour. He also suggested the relevance of 3D view, animations etc.

In most of the research papers concerning online visual merchandising elements, the common element researchers considered for the study is **navigation**. Navigation is a path by which consumers find the products they need. According to Gomony et al, (1999) navigation is very important in the view of finding or tracking the product or service of consumer's choice. Lee et al, (2001) studied navigation in the perspective of different websites and suggested that a good navigation system in a website can increase sales volume. Koivumaki (2001) in her research paper identified the relationship between navigation and customer satisfaction. She was predicting the interrelationship between ease of navigation and customer satisfaction.

Most of the prominent researches in the field of online visual merchandising give a lot of importance to website atmospherics. Dailey, (2004) in the research paper endorse that satisfying atmospherics will lead to customer satisfaction. Ha et al, (2007) suggests different factors under **atmospherics**. They suggest that colour, signage are part of atmospherics. Eroglu et al (2001) identified atmospherics as an important element of visual merchandising both online and offline. Hunter and Mukherjee (2011) suggested that consumer buying preference can be associated with online visual merchandising elements. And he found that

atmospherics have a positive influence on customer preference.

Then and Delong (1999) in their research paper suggested that product demonstration is a prominent online visual merchandising tool. In their paper they have divided product demonstration into **product view dimensionality**, product presentation and product information. According to Gomory et al (1999) proposed that product view dimensionality means 2D and 3D view of products in online websites. They also pointed out that zoom function is also a part of product view dimensionality. Halepete and Park (2006) recommended the use of different dimensions of the product to be displayed in an e-commerce website. They proposed that a positive image about the website can be created using product view dimensionality.

Potts, k. (2007) proposed through their research finding that **product presentation** adds value to the consumers in two ways. They identified that product presentation leads to a pleasing environment and makes it easy for the customers to browse e-commerce websites. Nilsen (2001) proposed that a good product presentation in an e-commerce website will make it easy for the customers to process the information provided in the website and it will be easy for the customers to find the products of their choice in a comfortable manner. Seock and Norton (2007) did a research among female students and identified that product presentation have a direct association with customer satisfaction.

Kerfoot, S., Davis, B., Ward (2003) have done a research on different online visual merchandising elements and they identified the relation between information quality and impulse buying. In their paper they pointed out the importance of **product information** on buying behaviour of the customers. (McCormick and Livett, 2012) opined that if the quality of information regarding the product is worthy there is more chance for customers to buy a product on impulse.

1.2. Generation X, Y, Z

Generation X consumers incline to search for product information. This generation ranges from the age group of 42-53 (Williams, Page, Petrosky & Hernandez, 2010). They are doubtful about today's marketing and advertising strategies and tactics. They are very loyal customers and do not mind spending money to try a new product. (Chaney, Touzani & Slimane, 2017). They are more conscious about the quality of products and brands. They are not too much focused on trends and fashion.

Generation Y also known as millennials are more prone to buy online. They prefer to buy products using e-commerce websites rather than stopping at an offline store to buy products. (Chaney, Touzani & Slimane, 2017). Generation Y belong to the age category of 24-41 (Williams, Page, Petrosky & Hernandez, 2010). Generation Y are more influenced by other people's opinions. In an online store the use of recommendation agents will create more sales from Generation Y people tend to buy products based on new trends and fashion.

Generation Z belong to the age category below 23 (Williams, Page, Petrosky & Hernandez, 2010). Generation Z is fully into social media and new gadgets. Generation Z has the proficiency of fast adaptation into newer

technologies(Chaney, Touzani & Slimane, 2017). Generation Z is deliberated to be born into the world of technologies and inventions

IV. Objectives

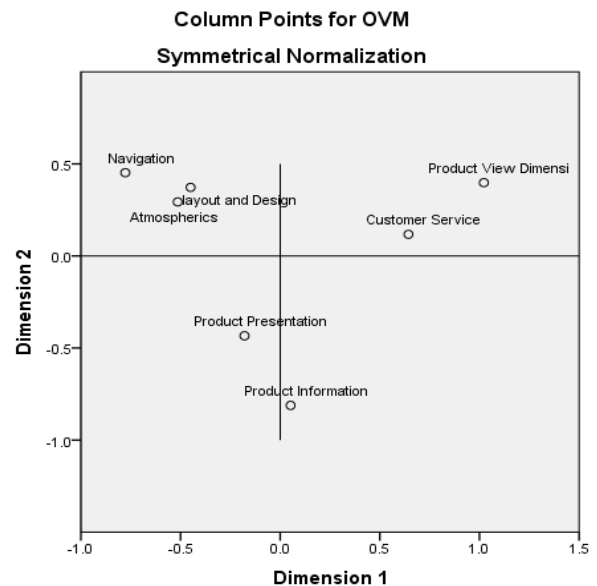
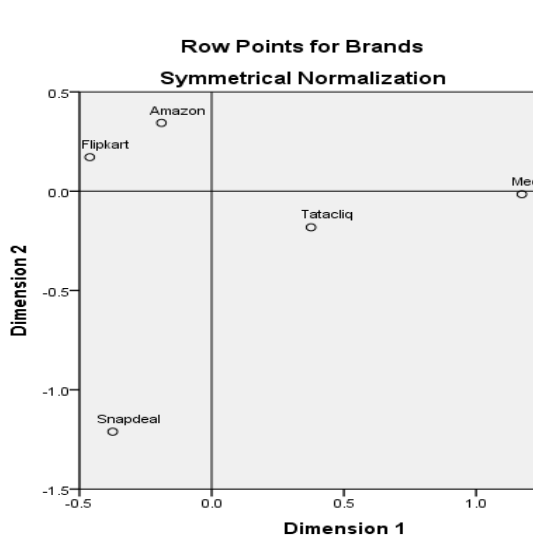
1. To study comparable Multi branded Multi Product E-Commerce Websites and Online Visual Merchandising Elements.
2. To study the association between Multi branded Multi Product E-Commerce Websites and Online Visual Merchandising Elements.
3. To find multidimensional display of Multi branded Multi Product E-Commerce Websites and Online Visual Merchandising Elements.

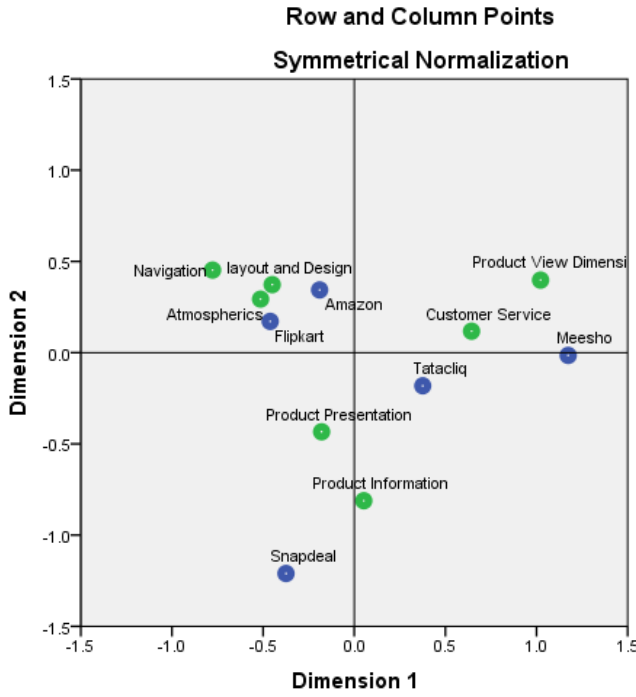
**Generation X
 Summary**

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Standard Deviation	Singular Value Correlation
					Accounted for	Cumulative		
1	.346	.120			.573	.573	.029	-.033
2	.223	.050			.237	.810	.032	
3	.166	.028			.132	.942		
4	.110	.012			.058	1.000		
Total		.210	216.624	.000 ^a	1.000	1.000		

V. Methods

The research was descriptive as well as analytical in character. The participants in the study were members of Generation X, Generation Y and Generation Z. A total of 300 people from Kerala were chosen to collect data on the study variables. From all the three generations for data gathering, an online questionnaire was used. To develop inferences and conclusions, various statistical approaches were applied to the data. The Statistical Package for Social Sciences (SPSS) Version 24 was used to conduct all of the analyses. Correspondence analysis was used to compare different online websites and most influencing visual merchandising elements. The websites considered for the study are amazon, flipkart, tatacliq, meesho and snapdeal.



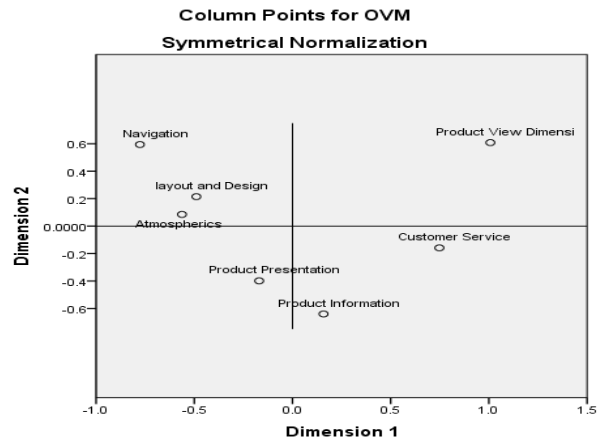
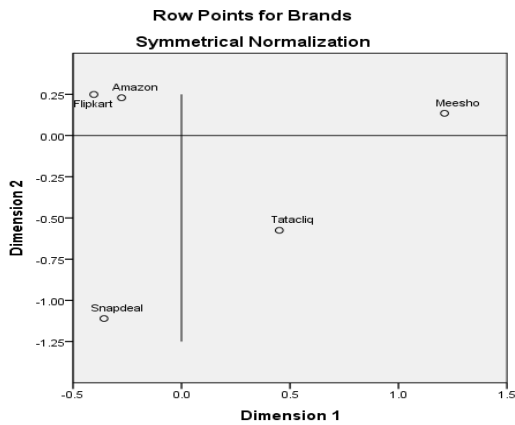


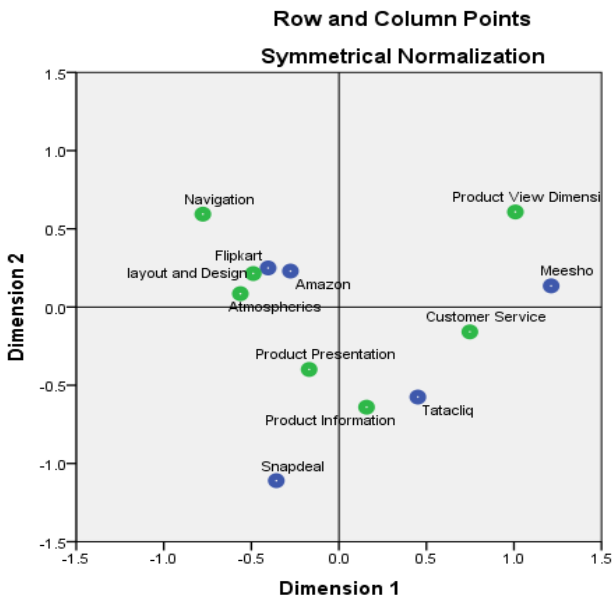
The chi square value is 216.624 and P value is 0.000 which is less than 0.05. It means there exists significant relationship different Multi Brand Multi Product E-Commerce Websites and Online Visual Merchandising elements. In the row column point analysis, it has been observed that Amazon and Flipkart relates with the Online Visual Merchandising Elements: -Navigation, Layout and Design, Atmosphericers. The E-Commerce website Meesho relates with customer service and Product View Dimensionality, Tatacliq with product Presentation and Product Information.

Generation Y

Summary

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Singular Value	
					Accounted for	Cumulative	Standard Deviation	Correlation 2
1	.365	.133			.627	.627	.029	.021
2	.206	.042			.199	.827	.029	
3	.173	.030			.141	.968		
4	.082	.007			.032	1.000		
Total		.212	215.430	.000 ^a	1.000	1.000		

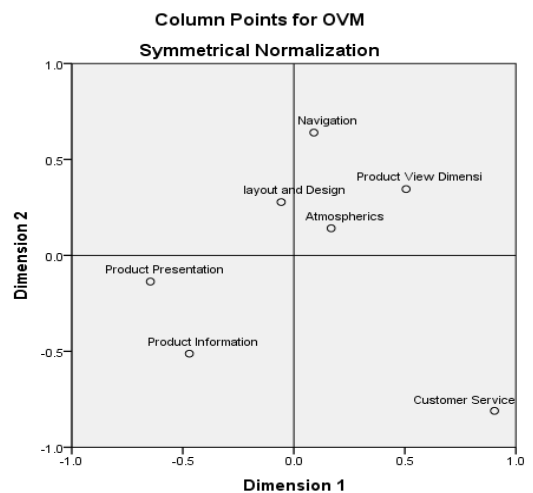
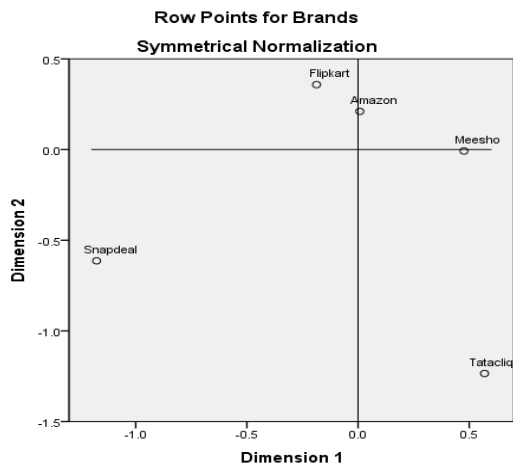


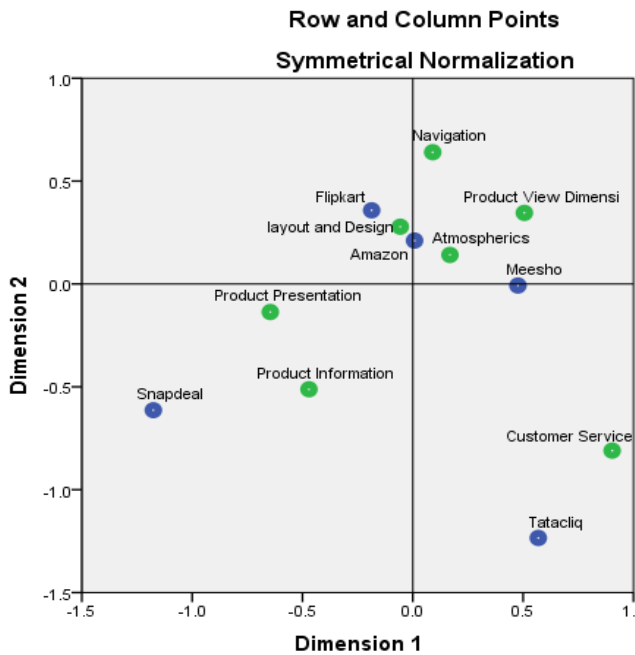


The chi square value is 215.430 and P value is 0.000 which is less than 0.05. It means there exists significant relationship different Multi Brand Multi Product E-Commerce Websites and Online Visual Merchandising elements. In the row column point analysis, it has been observed that Amazon and Flipkart relates with the Online Visual Merchandising Elements: -Navigation, Layout and Design, Atmospheric. The E-Commerce website Meesho relates Product View Dimensionality, Tatacliq with customer service and Product Information and snap deal with product presentation

Generation Z Summary

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Singular Value	
					Accounted for	Cumulative	Standard Deviation	Correlation
1	.233	.054			.517	.517	.028	.168
2	.203	.041			.395	.912	.029	
3	.077	.006			.057	.969		
4	.057	.003			.031	1.000		
Total		.105	118.213	.000 ^a	1.000	1.000		





The chi square value is 118.213 and P value is 0.000 which is less than 0.05. It means there exists significant relationship different Multi Brand Multi Product E-Commerce Websites and Online Visual Merchandising elements. In the row column point analysis, it has been observed that Amazon and Flipkart relates with the Online Visual Merchandising Elements: - Layout and Design. The E-Commerce website Meesho relates Product View Dimensionality, Navigation and atmospherics. Tatacliq with customer service and snap deal with product presentation and product information.

VI. Discussions

The study is to understand the factors or elements of online visual merchandising different generations are associating with different e-commerce websites. From the current study it is understood that Generation X people identifies navigation, layout and design and atmospherics to amazon and flipkart. They identifies product view dimensionality and customer service to meesho and product information to tatacliq and product presentation to snapdeal. Generation Y people identifies navigation, layout and design and atmospherics to amazon and flipkart. They identifies product view dimensionality to meesho, customer service and product information to tatacliq and product presentation to snapdeal. Generation Z people identifies layout and design to amazon and flipkart. They identifies navigation, product view dimensionality and atmospherics to meesho, customer service to tatacliq and product presentation and product information to snapdeal. From the study we can understand that there is a difference in the perception of different generations of people in kerala on the online visual merchandising elements and how they are associating these online visual merchandising elements to different websites. This study is not a conclusive study. There a lot more variables that can be considered and there are many more websites that can be considered.

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New Great Game: Russian - Chinese Energy dynamics in Central Asia

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Abstract

Reliable supply of energy is one of the most important necessity for the development of industries and other frameworks of a country. The present study is focusing on the ongoing New Great Game and emerging energy politics in Central Asia with special focus on two giant neighbors of the region i.e. Russia and China. China's growing economic involvement in Central Asia's energy resources and its political influence over Central Asian political leaders are a matter of serious concern to Russian politicians and thinkers. The present paper analyzes increasing role of energy politics mainly oil and gas and the rising competition of neighboring powers in energy sector of Central Asian states which has spurred the New Great Game in this region.

Key words

New Great Game, Energy, Geopolitics, China.

INTRODUCTION

The disintegration of the former Soviet Union in 1991 and after the collapse of the Berlin wall in 1989 ushered a new era of regional as well as international politics. The breakdown of the former Soviet Union resulted in the emergence of five independent states in Central Asia: *Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan*. The retreat of Russia from Central Asia ended up in creating a power void in the heartland that prompted significant world and regional powers to harness the hydrocarbon resources and exert their influence in the area. Many scholars preferred to call this renewed interest of external powers as the 'New Great Game' to distinguish it from the classical 'Great Game' between British India and Czarist Russia. The present paper is an attempt to examine the conceptual underpinnings of the New Great Game in Central Asia with special focus on Russian and Chinese interests. Here we will discuss the role played by two giant neighbours i.e. China and Russia in the Central Asian region. The focus will be on the areas of agreements and disagreements between them.

Energy resources in Central Asia

The growing demand for energy in Europe and Asia has led regional and international forces to think about natural resources in Central Asia [1]. Unlike the known oil deposits of Azerbaijan, the large hydrocarbon reserves of Caspian Basin of Central Asian republics remained unexplored during the Soviet era. These states are endowed with huge gifts of nature, but without access to the ocean. Hence, they're landlocked countries. In Central Asia, large resources and abundance of energy have been captured by regional and global powers like China, Russia and the United States. To know the energy politics within the region it is crucial to have

a look on energy potentials of Central Asian region. Among all the five Central Asian states three of them are known to

possess huge amount of oil and gas reserves i.e. Kazakhstan, Turkmenistan and Uzbekistan whereas other two Central Asian states i.e. Kyrgyzstan and Tajikistan have water resources.

While Kazakhstan especially known for its large reserves of oil, Coal and Uranium deposits, Turkmenistan & Uzbekistan are known for their huge gas reserves. Kyrgyzstan produces significant amount of hydroelectricity power. Just in case of Oil resources, let's look at Kazakhstan first. Kazakhstan is the emerging energy supplier within the region and has created an example of economic development in entire Eurasia. Kazakhstan is the net energy exporter also [2]. Kazakhstan is a major oil producer and it's 30 billion barrels of oil is second largest in Eurasia after Russia. The oil sector of Kazakhstan accounts 25 percent of GDP and 65 percent of its total exports and 40 percent of its total budget revenue by 2011[3]. It's the second largest oil reserves and production after Russia [4]. It has the twelfth largest deposits of oil within the world and second largest in Eurasia and Europe after Russia [5].

Turkmenistan is also sufficiently rich in oil reserves. Based on the estimates of British Petroleum (2016), Turkmenistan has proven oil reserves of roughly 0.6 thousand million barrels and it has a production capacity of 261 thousand barrels per day [6]. In case of Gas, the natural gas production in Kazakhstan is much more modest. Whereas in case of Turkmenistan it is rich in oil fields and especially gas. Turkmenistan and Uzbekistan are the two leading gas producers in this region. The Turkmenistan Statistics Commission reported 70.6 billion cubic meters of gas in 2017. In case of Uzbekistan it has significant hydrocarbon reserves especially natural gas, and its economy is heavily

dependent on the country's energy resources. It accounts for more than 40 percent of the entire Central Asia's natural gas and 20 percent of its oil. It has estimated 600 million barrels of oil [7]. Besides Kazakhstan and Turkmenistan, Uzbekistan has sufficient amount of oil and gas in the region. In case of Kyrgyzstan and Tajikistan, the two water abundant Central Asian Republics, constitutes 80% of the water resources of the region.

New Great Game: Geopolitics of energy

The Central Asian region has been known for its long historical and multilateral rivalries which perpetually saw interventions by many giant powers for centuries. The idea of 'New Great Game' came out from the 19th century concept of 'Great Game'. The concept of "Great Game" was first mentioned by 'Arthur Conolly', but was popularized by the writer Rudyard Kipling. It signifies the political rivalry and territorial expansion between Great Britain and Russia. In the 19th century, Britain feared that other European powers might take advantage of the political and territorial decline of Islamic Asia. In addition, the vast territory of the Russian Empire and its ambitions have also attracted the attention of the British, who remain vigilant about the actions of the Russians. However, Since Russia was ruling over huge number of Khanates such as in Central Asian region (Khiva, Bukhara, Kokand) it made Britain worried about losing its most precious possessions, India, to the Russians. The British inevitably believed that the ruling/conquering Afghanistan will be a strategy of Russia before it will occupy India. As a result, Britain announced the first Anglo-Arab war (1839-1842), which was one of the most important conflicts signifying the 'Great Game' [8].

Although the respective 'Great Game' embodied a set of distinct actors and agendas, the organic continuum linking the two cannot be and should not be overlooked. Since the region remains the same i.e. Central Asia which is still the area of debate between many great powers in the present geopolitics. This New Great Game is a varied mix of gaining not only economic exploitation but also strategic and geopolitical advantages. In the 1990s, some used the word 'New Great Game' to describe the rise of geopolitical interests in Central Asia in the context of the region's energy reserves, which were accessible to foreign interests after the collapse of the Soviet Union [9]. In 1997, for example, the New York Times published an article entitled 'the New Great Game', which stated that Central Asia was another battleground, an old game, and a geopolitical hardship of great powers. The New Great Game shows that the newly independent countries of Central Asia are also more involved in the international relations of their region, because they want to cooperate without risk with the great powers.

The central issue is regarding the other players involved in the New Great Game How is it different from the previous game? As explained in the previous section, the predominant actors in the last Great Game were Britain and the former Soviet empire. In addition to the power of these two colonies, the power dynamics in the New Great Game have changed. After the disintegration of the former Soviet Union and the collapse of the British Empire, new players emerged. The struggle for power is no longer a two-way street, but a multidimensional conflict. It is important to emphasize the fact

each (new) state in Central Asia had own goal and different method to achieve the macroeconomic growth. It would be a mistake to ignore or treat the newly formed Central Asian republics as pawns in a game of global equilibrium [10]. What needs to be considered in equal proportion is the 'intrinsic merits and interest of these nations' [11] hence, the Central Asian nations cannot be treated as 'secondary actors' in the New Great Game [12]. In fact one cannot ignore the non-state actors in making a case for New Great Game. The non-state actors also include the supra-state actors like NATO (North Atlantic Treaty Organization), the United Nations, SCO (Shanghai Cooperation Organization) and EEU (Eurasian Economic Union).

Russia and China: Convergences and Divergences

Russia and China are the two prominent actors which redefine the energy politics of central Asian region in the contemporary global politics. Since the New Great game revolves around controlling natural resources of the region the paper is focusing on energy and pipeline politics among these giant powers i.e. Russia and China. Historically Russian route was the soul passage to transport Central Asian oil and gas to other part of the globe. For example, during Soviet times, the rich Caspian basin region and Central Asia used to be the significant part of Russian zone of interest to fulfill its economic interests. The Atyrau-Samara pipeline was the oldest and the only way to transport oil from the Caspian Sea to Europe. Along with this, the Russian controlled Central Asia Centre (CAC) gas pipeline has cooperated with Kazakhstan, Turkmenistan and Uzbekistan for more than 40 years to transport natural gas to European market [13]. Therefore, it showed a relationship of dependency between Central Asian states and Russia which soon become a concern for Central Asian leaders.

Soon after independence, the newly liberated Central Asian states started looking for an alternative for three reasons: firstly, to reduce their dependence on Russia. Secondly, to achieve their economic interest via new connections and thirdly, to diversify their energy routes from Russia. Here starts the role of China, the game changer, in Central Asia which intensified the New Great Game in the region. The former Soviet Union's Central Asian space soon become an increasingly important area for the realization of Beijing's foreign policy and economic interests. China started collaborating with Central Asian Republics soon after realizing the energy significance of the region for its emerging oil thirst. The Chinese company China National Petroleum Corporation (CNPC) entered Kazakhstan in 1997 and purchased 60.3 percent of the rights to explore and develop oil companies as well as other oil fields. Later on, the partnership resulted into a landmark project i.e. Kazakhstan-China oil pipeline in 1997. Similarly, China made another direct pipeline route which runs through Turkmenistan (188 km), then Uzbekistan (530 km) and then through South Kazakhstan (1333 km) to the west of China. Therefore, China and Turkmenistan signed the Turkmenistan-China Gas pipeline agreement in 2007 which is commonly known as Central Asia-China Gas pipeline. Beside this China signed a similar agreement with Uzbekistan in April 2007 to expand its energy network to all

the energy rich Central Asian states. Therefore, there are already two main pipelines from Central Asia to China i.e. the Central Asia-China gas pipeline and the Kazakhstan - China oil pipeline which are working. Taking into account China's plan to increase gas imports from Central Asia by 5 times by 2015, the capacity of the Central Asia-China pipeline has increased to 55-60 billion cubic meters per year [14]. These developments like controlling transportation routes, huge economic investments made China to increase its significance in the emerging geopolitics or we can say New Great Game of the Eurasian region. In the contemporary time, the emerging Chinese initiative China's Belt and Road Initiative (BRI) placed Central Asia in a very crucial position. However, this Chinese centric 'New great Game' is quite different from the classical Great Game.

The classical Great Game focused more on territory expansion whereas the New Great Game focused more on energy and security perspectives. The next section will focus upon the most prominent part of the paper i.e. Russia-China relations: convergences and divergences.

Convergences

The strategic plans of China and Russia have changed dramatically since the mid-1990s. The two major powers have gradually eliminated mutual fear and forged a broad multilateral partnership within the Shanghai Cooperation Organization (SCO). On the issue of collective security and energy security, the two countries (China and Russia) firmly oppose the dominant position of the United States in international affairs mainly Central Asia. Therefore, the foremost and most important area of Russian and Chinese nexus comes with the entry of U.S. in Central Asia especially after September 11, 2001. Central Asia has been the center of US foreign policy since the terrorist attacks of September 11, 2001[15]. In the aftermath of the attack, the United States and its allies established bases in Uzbekistan, Kyrgyzstan and Tajikistan for Taliban and al-Qaeda forces in Afghanistan. The US security services in the region have grown rapidly. But with the weakening of US power in Central Asia, China-Russia integration in the region has been growing hence, this Sino-Russian nexus has replaced the American influence in Central Asia. However, the scope of Sino-Russian strategic cooperation, such as Central Asia, is limited to many factors. The U.S. foreign policy could upset the Sino-Russian-US balance in Central Asia and boost cooperation between the three major powers in the region.

Both Russia and China have blessed the US military presence in Central Asia since 9/11 because they have supported the war on terror but feared that the United States would remain in the region for too long. In August 2005, China and Russia organized their first joint military exercises since the events in Uzbekistan. The exercise, known as the 2005 Peace Mission, was sponsored by the Shanghai Cooperation Organization where the deployment of troops was organized between the two countries to restore order in a third country affected by unrest major ethnic groups. Russian and Chinese officials have said the exercises are aimed at strengthening cooperation between the two countries in the fight against terrorism and extremism. They are not targeting any third country, but many have said that this is another target that has

been pointed out to the United States in order to show the closeness between them (Russia and China) [16]. Another matter of concern for U.S. is the Iranian membership in SCO which eventually made U.S. worried about the emerging partnership between Russia and China. Given this situation, US experts are concerned about the possibility of China and Russia equating the United States in Central Asia, especially if it seeks to expand closer ties with Iran which can create serious clashes between major external powers around the region's "New Great Game".

Russia is trying to increase its influence in the post-Soviet space, including the newly emerged and independent Central Asian Republics. Moscow has tried to integrate these states into a single security organization which it personally controls which keeps the West, especially the United States, out of this organization. It aims to protect Russia's southern borders from vulnerable Islamic extremists, drug trafficking and other threats. Moscow uses its energy policy to build dominance in the region. It strives to dominate the Central Asian gas industry in the development of oil and gas reserves off the coast of the Caspian Sea and plays an important role in controlling hydroelectric generation in the region. Moscow hopes to use Gazprom's "natural gas caliphate" in Central Asia as the basis for the Soviet Union's "natural gas alliance".

The strengthening of Sino-Russian relations between China and Asia stems from common concerns about border security. The Shanghai Cooperation Organization is a product of the 1996 and 1997 Sino-Soviet Frontier Delimitation Agreement and the agreement to reduce the military presence of the two countries in the border area. The agenda is gradually expanding to include a broader concept of local and regional area security. Uzbekistan received observer status in 2000 and officially became a member of the Shanghai Cooperation Organization (SCO) on Thursday, June 2001. Russia and China hope to use the Organization to combat the "three evils" of terrorism, discrimination and extremism [17]. The Shanghai Cooperation Organization has established a regional anti-terrorism agency in Tashkent (Uzbekistan) and a secretariat (SCO) in Beijing. The SCO joint statement focused on issues such as racial conflict, religious extremism, international terrorism, ethnic crime, arms trafficking, drug trafficking and illegal migration. The SCO established staff to address issues of economics and trade, culture, the environment, law enforcement, and diplomacy.

As we discussed, besides their strong bond in Shanghai Cooperation Organization, concerns about the dominance of the United States in Central Asia are particularly significant for China and Russia. None of the countries opposes US efforts in Afghanistan since it concerns all the three major powers i.e. China, Russia and U.S. The overthrow of the Taliban and the attack on al-Qaeda have significantly reduced the threat to Russia and China in the region. However, both countries oppose the war in Iraq and fear an increase in US troops in Central Asia. Despite Russia's legitimate opposition to US intervention, China is concerned about the strategies used by U.S. i.e. to promote democracy in post-soviet region including Central Asia. This major issue worried both Russia and China and pushed them against U.S.

[18]. The pro-democracy series i.e. “Color Revolution” of the former Soviet Union began with the Rose Revolution in Georgia in 2003 and continued with the Orange Revolution in Ukraine in 2004. The uprising in Kyrgyzstan in March 2005 overthrew the Askar Akaev’s Army regime. When this progress developed, both Russia and China regarded U.S. support for democratization as a threat in Eurasian region. Russia and China have common interests, especially the desire to limit American influence especially in the promotion of democracy in the region which led to the declaration of US military bases. Despite these common interests, there are several factors that limit this relationship which is well defined in the next section.

Divergences

Though Russia and China have common interests, especially the desire to limit American dominance in energy rich Central Asia. In some ways, Russia and China are not true allies, but diverge as well. Russia has expressed concerns about its economic policies in Central Asia, including plans to develop infrastructure closely related to overcoming stagnation in the Far East. Russia fears a new east-west transport route through the Caucasus and Central Asia could hurt its economy, limit growth in eastern Russia and threaten its territorial integrity. According to Russian political leaders, China's growing territory could pose a threat. Thus, Russia has ambitions to create a North-South trade corridor connecting Russia, Iran, India and Central Asia[19]. Russia believes that China's development in the Pakistani port of Gwadar is at odds with its goals. China's efforts to find energy resources in Central Asia run counter to Russia's goal of establishing an energy monopoly in the region.

China respects Russia's interests in Central Asia, but resists pressure from Russia on powerful states. China does not intend to separate Russia from Central Asia, but hopes to strengthen its position in the region in long term to complement what Russia can manage and control[20]. In addition, the goals of Russia and China in the Shanghai Cooperation Organization are not exactly the same. China seeks Russian participation to increase the credibility of the organization, but Russia may firmly defend its own interests. As far as Russia is concerned, it realizes that it can no longer provide stability to Central Asia, so it seeks China's help. This organization helps Russia to control and restrict China's activities[21], but it also limits Russia by proposing a forum to protect China's security and economic interests in the region. Another major aspect where Sino-Russian clashes can be seen i.e. the energy sphere of Central Asian region. Russia thought of Central Asia as its ‘soft belly’ and it would not accept interference of other states on its immediate neighbours[22]. Nevertheless, there are some Eurasian projects promoted by Russia and China i.e. SCO, OBOR and EAEU where different projects manage to co-exist, compete and compliment to each other. Nevertheless, China's grandiose strategy in the form of a giant infrastructure development project envisaged as "One Belt, One Road" or "Belt and Road Initiative", involving the entire ancient world in general and the Eurasian continent in particular, can be seen as a silent rise of China in the post-Cold War era hence, shows a China-dominated New Great Game. From energy

resources to raw materials; business transactions with security measures; a global belt (one belt, one road) for more domestic bilateral collaborations, the Central Asia's potential for China is the most significant one.

CONCLUSION

Lastly, it can be concluded that despite the major convergences between Russia and China in the Central Asian region the competition between both the giant states will continue to grow. Russia being the historical partner of post-soviet states, mainly Central Asia, will always have an upper hand in influencing the energy rich states like Kazakhstan and Turkmenistan to follow its diktats. However, with the huge economic emergence of China in Central Asia, the Chinese presence in Central Asia seems to be totally uncontrollable. This energy related competition and collaborations in the Eurasian region particularly in energy rich Central Asia will shape the New Great Game more in future.

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Effectiveness of Automotive lighting system Powered by 220 Volt/ 3 ampere power supply

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Abstract

This study aimed to develop and evaluate the performance, functionality and acceptability of Auto lighting powered by 220 volt/3 ampere power supply for the Bachelor of Science in Industrial education, Major in Automotive , BSIE –TLE122 Automotive and also the Grade 10 TVL – Automotive Students of College of Technical Education, Don Mariano Marcos Memorial State University Mid La Union Campus, San fernando City, La Union. A power supply with input of 220 volts and output of 12volt direct current was used as the source for the current of the mock up instead of a lead acid battery. The descriptive comparative survey was employed in assessing the perception of the respondents in terms of the effectiveness of the mock up. The mock up was evaluated as to its of functionality and acceptability by students and of faculty of DMMMSU-MLUC during the School Year 2013-2014. The data gathered was analyzed using weighted mean. The study revealed that the mock up was valid, functional and accepted in Auto lighting circuit lesson.

Keywords

Auto lighting, Effectiveness, Mock up, Power Supply.

I. INTRODUCTION

Teaching automotive technology may not be a simple task if there is a shortage of instructional devices that can facilitate the acquisition of knowledge and skills development of the learner.

Shortage of instructional materials / device and equipment affects quality of education in technology. Many schools, colleges and universities offering technology courses face problems like lack of tools, equipment and other facilities required in the teaching-learning process.. [1] Mendoza.

As such, it is difficult to both the students and the instructors to develop the desired attitude and skills. With this concern at hand and challenged by it, the researcher has come up with the idea of constructing Integrated Electrical Wiring Installation Panel Trainer to accelerate the learning assimilation of knowledge and skills of electrical students. Zulueta [2] “unpublished” cited that generally that there is a relationship between effective teaches and effective school. Teachers to be effective, need a supportive and positive climate.

The instructor should make necessary innovation to become effective and efficient in delivering his lesson. Innovation according to Webster [3] making of changes or alteration in anything established.

It means the researcher wishes to innovate teaching process in his own way of using the power supply as his source of current for the mock up. Innovation is creating new ideas into a useful the diffusion of innovation theory seek to explain how and why new ideas and practices are adopted.

Innovative teaching [4] Golam.K. is necessary for the present and future of education to help students to reach their full potential. Higher education should serve the long term

intellectual needs of the student, for example, whether providing new material by teachers helped the student to gain new insights or opened up new channels of intellectual stimulation or enhanced student’s essential and creative thinking power?. Innovative teaching is a necessity for all teachers in order to meet the educational needs of the new generations. However, teachers’ competency for innovative teaching is a key factor influencing innovative teaching performance. Some research points out that many teachers lack competencies for innovative teaching.

Innovation as cited by [5] Fransisco, he mentioned that as a teacher need to up date his method of teaching, there has to be some innovation in the teaching method to be able to cope up with the present situation

On the study of innovation (Gundongan 1999) his study describes the perceived technical and teaching in-service education needs of secondary education auto mobile technicians, technological innovations and rapid knowledge generation of knowledge.

One way to facilitate learning is the use of instructional materials . Instructional materials are used to improve students’ knowledge , abilities, and skills,

to monitor their assimilation of information, and to contribute to their overall development and upbringing, Some learning takes place from the things that learners hear; more learning takes place from the things that learners see; and, still more learning transpires from what learners do. Hence, the importance of providing adequate, appropriate and varied instructional materials to concretize and substantiate learning . [6] Tominez

Instructional materials resource s to improve the students knowledge, abilities and skills, to improve their assimilation of information and to contribute to their development and upbringing.

The use of mock up as a working replica made from real or synthetic materials, is an imitation of real things used when practice or training on real object would be too costly or impossible due to size. She also stressed that mock ups can be used in all grade levels since children enjoy imitating the activities of adults.

One area of Automotive Technology is auto lighting which is complicated because of circuitry[6]Fernandez. As the researcher had experienced some difficulties of teaching this lesson, he came up with experiment using a power supply instead of using battery and came up with a mock up.

For traditional method of teaching automotive lighting, the battery is widely used as source of current for lighting the mock up is Battery [6]Duffy. is a source of power invented by Alessandro Volta

The researcher used a power supply or seldom called as inverter. its function is to convert alternating current into direct current. When battery is used especially the lead acid battery has a lot of maintenance, it needs to be recharged and refilled with battery solution, The researcher had come up to use a power supply.

According to Industrial Training University Incorporated [7] the instructor will easily be able to familiarize themselves with this training panel and be able to teach how each is used in electrical wiring installation. Most of this electrical training class is spent learning on these real-world powered electrical panels with real electrical components commonly used around the world today. The student, using the methods learned in this class, will use their newly found skills to find and actually fix the problems. Training Panels utilize a modified feed voltage (12.0 to 24.0 V ac) that allows students to work with actual powered circuits yet protects the student from shock or burn.

Andaya [8] constructed an “A.C. Machine Circuit Trainer” using locally available electrical supplies and materials. The trainer is modular in nature and is evidently identified induction and autotransformer D.C. regulated power supply and incandescent lamp circuit. The findings stated that his trainer is very a useful training apparatus in electrical technology.

Evangelio [9]“unpublished” designed and constructed a “Plug-in type Electrical Wiring Trainer”. It was subjected to tests for functionality and reliability when used in performing 3-phase and 1-phase line connection. The results revealed that it is feasible to construct a plug-in type electrical wiring trainer that can be used to demonstrate various electrical circuits

A car battery cost P3,500 and needs a charger to become functional, the price of inverter is only P 1,000. And needs only a power source from electricity.

Several researches used a battery as source of current like the study of [6] Fernandez , of Partido state College, where finding revealed that the concept topic in the trainer were very helpful in providing the students the necessary knowledge in the auto lighting system. The use of the trainer is, therefore, to upgrade learning of the students in auto lighting system.

Another research [10](Sudomboon. “Entitled : the Effectiveness of Web-Based training application in Automotive Electronics system, the study compared the

web-based training to conventional training groups were significantly different. The findings demonstrated that the web-based can effectively enhance students achievement into auto electronic system.

Tannehill,[11] of University of Missouri, USA, conducted a study on the use of a low fidelity computer simulation in teaching the diagnosis of electronic automotive system. The primary purpose of the study was to compare the performance of auto mechanics students who practice the procedure on the actual vehicle with actual equipment. After receiving appropriate instruction Tannehills students were divided randomly into two groups. Group one underwent guided practice of the diagnostic procedure on computer simulation , group two underwent guided practice on actual vehicle. After practice, the students were asked to perform the procedure as written on the activity sheet. The students’ performance was assessed on a summative and a formative criterion-reference basis.

The chi-square test of association was used to test for significant difference between summative scores. The Mann-Witney U test was used to determine significant difference between formative scores.

BALLON [12] “unpublished”. His research entitled “ Design and Construction of simplified Television Reciever Circuit Trainer. Focusing steps in constructing the Trainer. Questioner was employed in answering the effectiveness of the trainer as well as in developing the trainer to help the teacher to test the learning capability of the students.

Baantog [13]“unpublished” studies Entitled Instructional safety device for Driving: Its Design and Construction. A development study to design and construct and evaluate an instructional safety device for driving that can incorporate to vehicle or car used for driving lesson. The primary source of data was the questionnaire, answered by the students of the College of Industrial Technology major in Automotive and faculty respondents. Descriptive statistical measure such as percentage frequency, weighted mean were used to come up with the level of acceptability reflective of the functionality and ease of operation on the prototype.

Icarom [14]“unpublished” studied on the “Effectiveness of Using Information sheet in teaching Drafting, the performance of students in technical drafting taught using information sheet was higher than those taught without using information sheet.

The present study, however distinguishes itself in combining the features of the different studies presented The aforementioned studies are similar to the present study because the latter dealt with effectiveness of trainer, the researcher attempt to create an innovative approach in enhancing learning in the auto lighting system.

The mock up to be developed is important and relevant most specifically to the students and teachers in Automotive technology. This project will provide sufficient opportunities for hands-on and experimental activities. This will supplement the traditional board and chalk employed by those who lack the necessary training materials. It will closely link the theoretical side of the subject to what is reality in the industry. It will serve as a training material to those who will be taking National Competency Test in TESDA for NC 1 and NC-2.

II. RESEARCH FRAMEWORK

The conceptual framework which guides the researcher in the conduct of the study is schematically portrayed in figure 1.

There were two stages in the study.

Phase 1, shows the stage which presents the use of 12volt3ampere power supply as the input variable; the process variable was the development stage, the mock up has gone two trials, the first trial was done on the first Semester of SY 2013-2014 and the second trial was done on the Second Semester of SY 2013-2014.

Phase 2 is called the validation stage that was conducted to Five faculty in the College of Technology on November 2014, the auto lighting mock up was evaluated in terms of its level of functionality and level of acceptability.

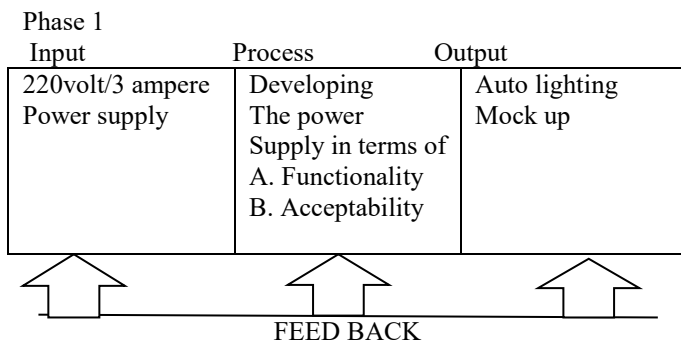


Fig.1 Trial Stages

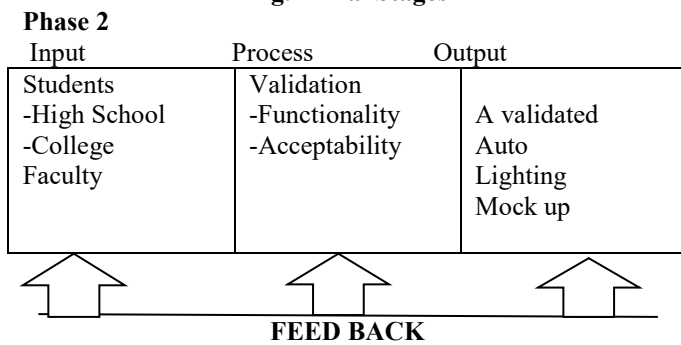


Fig.2 Validation Stages

Statement of Objectives

The purpose of this research is to develop and evaluate the performance, functionality and acceptability of Auto lighting powered by 220 volt/3 ampere power supply.

It specifically aimed to achieve the following objectives:

1. To develop an auto lighting mock up powered by 220 volts/ 3amper power supply;
2. To determine the level of performance of the auto lighting mock up in terms of
 - a. level of functionality,
 - b. level of acceptability;
3. To determine if there is significant difference with the perception of the respondents of the performance of the mock up.
4. To determine the return of investment.

Time and place of the study

The study was done during the Second semester, School Year 2013-2014 at the College of Technical Education - Mid La Union Campus, DMMMSU.

Definition of Terms

For better understanding of this study, the following terms are defined:

Auto electrical mock up it composed of lighting system or replica of a vehicle lighting system

Effectiveness it measure in terms of functionality with a given time

Lighting system it composed of headlight circuit, park light circuit, directional/signal/hazard, stop light, back up and horn circuit

Power supply the main source of current for the lighting system, it is powered by the current from the electricity

III. METHODOLOGY

Research Design

The study used the research and developmental process. Descriptive study will also be used to supplement the R&D process in gathering data in the evaluation of the project

The descriptive comparative survey was employed in assessing the perception of the respondents in terms of the effectiveness of the mock up.

Materials and procedure

The supplies and materials are presented in table 1. With the corresponding prices as of Calendar year 2013.

The researcher designed the mock up based from approved syllabus in Tech 105 Automotive Electricity. He prepared diagram for students to follow in connecting the circuitry as presented in figure 3.

The project was prepared by the researcher with the help of a student teacher. The mock up was pretested and post tested to the 35 students enrolled during the First Semester , school Year 2013-2014. It was found out that the mock up was functional.

Quantity	Unit	Description	Cost
2	Pcs.	Headlamp	640
1	Pc.	Ammeter	250
4	Pcs.	Bosch Relay	720
1	Pc.	Flassher relay	160
1	Roll	Automotive wire	800
1	Pc	Fuse holder	150
1	Pc	Transformer	720
2	Pcs,	Tail lamp	300
2	Pcs,	Park light	300
20	Pcs.	Male/female terminal	200
1	Pc.	terminal	50
1	Pc.	Electrical tape	1500
		Steering column switch	

Table 1. Supplies & Materials

Figure 2. Represent An Auto – Electrical circuit of the study which used a Diagram

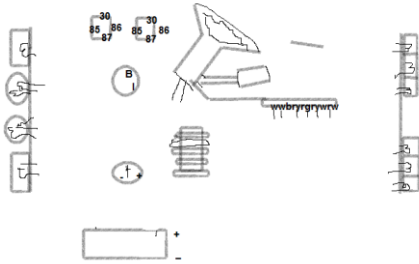


Figure 3. Automotive Lighting Circuit

Sampling Technique

The purposive or judgmental sampling technique was used for the respondents that was been employed was selected based on their knowledge of the aspects that they will be evaluating and the purpose of the study.

Research Instrument

The questionnaire for validation of the mock up in terms of functionality was lifted from the study of Fernandez(2010), Partido State College, Camarines Sur, Entitled “Electrical Trainer in auto Lighting System” and from Dr, Victorio P. Palabay, entitled “Proto type sheet Metal Engraver.

In interpreting the responses a weighted mean is used.

The qualitative interpretation are as follows:

Numerical rating	Descriptive rating
4.20 - 5.00	VeryHighlyvalid/Functional/accepted
- 4.19	Highly valid/Functional/Accepted
2.60 - 3.39	Moderately Valid/Functional/Accepted
1.80 - 2.59	SlightlyValid/functional/acceptable
- 1.79	Not Valid/functional/Acceptable

Validation and Reliability of the Instrument

To test the validity and reliability of the questionnaire, the researcher pretested 10 students which are not included in the study, and the five teachers of the College of Technology of DMMMSU-MLUC who have been teaching Automotive for 30 years.

Analysis of Data

Simple frequency count and weighted mean had been used to determine the weights of the various variables. Formula that was used:

$$Wt.x =$$

Where:

Wt.x = the weighted mean

$\Sigma f X$ = the sum of product of the rating times the frequency

N = the number of respondents

X = weight

$\Sigma f X/ N$

To determine the perception of the respondents a t-test was used

IV. Results and Discussion

Validation of the Mock up in Auto Lighting system

There are eight criteria in the questionnaire in the assessment of different aspect of the mock up in terms of functionality and acceptability.

Table 2. Presents the validation of the high school, collage and faculty on the functionality of the Auto lighting system powered by 220 volt/3 ampere power supply. The over all weighted mean of high school are 3.95 interpreted as highly valid, while the collage over all weighted mean is 4.41 interpreted as highly valid , while the faculty overall weighted mean is 4.70 interpreted as very highly valid.

On the validation of the respondent on acceptability of the auto lighting system high school weighted mean 3.75 interpreted as highly acceptable, while the collage weighted mean is 4.29 interpreted as highly acceptable and the faculty weighted mean of 4.50 interpreted as very highly acceptable.

Table 2. also presents the number of respondents, there are eleven (11) high school students from Fourth year, twenty one(21) collage students enrolled in TEHE

103 and five(5) faculty of the Collage of Technology teaching Automotive.

Table 2. Students and Faculty Validation

Functionality	High School N=11	Colloge N=21	Faculty N=5
1. Simplicity of mechanism	4.18	4.09	4.60
2. Are wires easy to understand	3.73	4.38	4.60
3. Is the size just enough	4.00	4.52	4.60
4.Is the mock up facilitate learning	3.91	4.66	5.00
Weighted Mean	3.95	4.41	4.70
Acceptability			
1. cost	3.91	4.47	4.60
2. Operation	3.45	4.33	4.60
3. Maintenance	3.81	4.47	4.80
4. Safety	3.81	3.90	4.60
Weighted Mean	3.75	4.29	4.50

AWG 3.85 4.35 4.60
Table 3 Analysis of mean score and t-test of the Collage and High school students perception.

Table 3 presents the perception of the students on the significant difference of the mean score. It showed that High school students has 3.85 mean perception while the collage students has 4.38 mean perception. The computed t-value of 4.52 very much higher than the tabular t-value at .05 level significance of 2.10. It showed that there is significant difference between the perception on the functionality and acceptability of the mock up.

Table 4. Analysis of mean score and t-test of Collage and High school students

Null Hypothesis, HO = There is no significant difference between the perception of The students on the effectiveness of the Mock up		
Data	X	Y
Mean	3.85	4.38
Difference between mean	0.53	
Computed t-value	4.52	
Degrees of freedom	16	
Level of significance	.05	
Critical t-value	2.10	

Cost Analysis

The cost of the project was based on the current price in terms of supplies and materials which amounted to P 4,620. Table 3. Shows the quantity, description of supplies and the amount spend for the project.

The total cost of the trainer amounted to P 4,620 while the general lighting mock up was P 7,310 with difference of P1,690. It can be inferred that the mock up was less expensive than the general lighting mock up.

Table 5. Bill of supply and materials

Qty.	Unit	Description	Cost
2	Pcs.	Headlamp	640
1	Pc.	Ammeter	250
4	Pcs.	Bosch Relay	720
1	Pc.	Flassher relay	160
1	Roll	Automotive wire	800
1	Pc	Fuse holder	150
1	Pc	Transformer	720
2	Pcs,	Tail lamp	300
2	Pcs,	Park light	300
20	Pcs.	Male/female terminal	200
1	Pc.	Electrical tape	50
1	Pc.	Steering column switch	1500
		Total :	P4,620

V. SUMMARY, CONCLUSIONS AND RECOMMENDATION SUMMARY

The main purpose of the research was to develop and evaluate the performance, functionality and acceptability of the electrical mock up pwered by 220 volt3 ampere power supply.

It specifically aimed to achieve the following objectives

1. To develop a auto lighting mock up pwered by 220 volts/3 ampere power supply
2. To determine the level of performance of the auto electrical mock up in terms of
 - a. level of functionality
 - b. level of acceptability

3. To determine if there is significant difference with the perception of the respondents of the performance of the mock up.
4. To determine the return of investment.

The findings of the study were:

1. The developed mock up was found to be effective on the different lighting system, the only uncertainty is the Headlight circuit where the 3 ampere cannot sustain the needed amperage which is 15 ampere.
2. The level of functionality as percieved by the respondent is 4.35 interpreted as highly valid , while the level of acceptability was 4.18 interpreted as highly valid
3. There is significant difference with the perception of the respondents of the performance of the mock up as evident with computed t- value of 4.52 and critical value of 2.1 at .05 level of significance.
4. The return of investment was P1,690 . therefore the mock up was cheaper than of the battery.

VI. CONCLUSION

1. The mock up was not as accurate as to be expected on its circuitry but it is highly Accepted because it gives knowledge on the design to further improve the amperage. So it should be adjusted to 6 ampere.
2. The level of functionality and acceptability was High so therefore it is then recommended to be used for instructional purposes.
3. There is significant difference between the perception of the respondents, that the mock up is then a substitute for the battery.
4. The mock up was cheaper than the conventional battery.

Recommendation

In the light of findings and conclusions the following recommendations were given:

1. Upgrading of the design for those who want to test the functionality
2. Since there is significant difference between the perception of the respondents the mock up should be used to enhance teaching and learning.
3. The administration should give serious attention to the upgrading of shop or laboratory exclusively for the College of technical Education especially the BSIE instructor and students. Not to displace this student to the College of Technical education and have there laboratory on the College of Technology.
4. The mock up should be a source for income generating for the CTED.

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Peer Coaching: The Emergence of Unintended Culture Change in Senior Management

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Abstract

This paper presents a longitudinal case-study of a culture change initiative at the senior management level in a large high tech company (LHT). It has long been recognized that organizational change attempts often result in unintended consequences, and the situation at the LHT was no exception. A program was designed to transform senior managers into high performers, and peer coaching groups were set up to facilitate this change. Based on our observations and interview data, we report how the peer coaching program deviated from its intended objectives and resulted in a highly positive culture of consultation and open discussions within the coaching groups. We argue that the existing readiness for change in the peer group and the fact that they had to meet regularly with their formal groups generated the unexpected but positive outcomes out of this change initiative.

Keywords

Culture change, unintended consequences, senior management, executive coaching

I. INTRODUCTION

A large multi-national high tech company decided to modify the organizational culture and assigned a new VP, with this mandate to initiate a culture change program for the senior managers. The pattern of thought in this practical situation, goes like this: if the way we do things does not result in desirable outcomes, we must change our ways by initiating a culture change and the best way to bring about culture change is by changing the behaviour of the leaders who are responsible for the desired outcomes in an organizational context. Finally, as it is easier to design and implement change programs for people, rather than change the structure of the organization to accommodate culture change, the management devised a program for changing the behaviour of senior management.

There is vast amount of literature on culture change. However, only a limited number of longitudinal case studies of culture change on senior management such as in [1], [2] are known. The unintended consequences of change have been recognized by a number of researchers as in [3]-[6], however, the discussion has been at a conceptual level and the number of empirical studies have been limited [7]. Typically, the studies evaluate the change program with respect to its objectives and minimal attention is given to the unintended facets of the change process.

The paper reports upon the success of senior managers who have taken part in the program to make them "top performers." It will demonstrate that the "coaching" groups formed and established their own "style" and often worked beyond the pre-determined period. We will also address some hypothetical issues related to change in business culture. The paper claims that changes in business culture are strongly influenced by business restrictions in specific situations that

are usually ignored, even though Lewin's (1951) concept of change is focused on modifications to these constraints [8].

II. THE LITERATURE ON CULTURE CHANGE

The topic of culture change gained popularity in the 1980s, as the North American producers sought to emulate the Japanese on the premise that their business models was responsible for the dominance of the Japanese production system [5]. Nonetheless, early analyses of attempts by North American companies to mimic the production culture of Just-in-Time revealed that implementation problems were often due to hard constraints such as the daily production limit, performance appraisal method used, and lack of coordination across functional units [9], [10]. Two observations from these studies are relevant to the current literature on culture change. First, it is useful to think of "culture" as an output of the work situations as opposed to some shared values in people's mind. Second, culture change may often require changing the context or the organizational situation in order to promote the desired culture as opposed to just changing people. Reference [11] emphasized this difference in the following quote:

Not all professions concern with motivation agree with psychology....lawmakers, highway engineers, industrialists, architects, for example, manipulate the pre-perceptual environment, and expect to elicit, and by and large succeed in eliciting the behaviour they desire....the aim is to insure "good" behaviour by rearranging "outside" conditions; no effort is made to change the intrapersonal sector of behaviour unit...psychotherapists and preachers appear to be among the few practitioners who aim to control the behaviour of others by altering the conditions within the person. [p. 52]

The basic theory of change started with the three-stage paradigm of Kurt Lewin (1951), in which a positive shift would entail "unfreezing," "moving" and "refreezing." Unfreezing relates to the relaxing of the restrictions on the evolving socio-technical structure, moving is learning a new pattern of behaviour, and re-freezing involves modifying the constraints to sustain and reinforce the new system [8].

Lewin's model has stayed as a helpful method of looking at the change process. A number of researchers have found that most of the change models end up being the three-stage of Lewin model [12], [13]. There is also recognition that difficulties are either at the unfreezing stage or at the refreezing stage when implementing the change process. For example, [14] pointed out the importance of being ready for change in the context of successful implementation of a new end-user computing system, and [15] discussed the challenges of re-freezing organizational change. It should be remembered that although Lewin's concept of change has stood the test of time, the application of Lewin's field theory-the foundation of his methodology-to the process of change remains rare (see reference [16] for a good example of applying field theory to the process of change).

Culture-change studies at managerial level were relatively rare as in [1] and [17] especially at senior management level. Executive coaching is one of the more recent mechanisms by practitioners to change the behavior of senior managers [18]. Empirical coaching studies are however also quite limited as in [19] and [20]. Reference [20] acknowledged this shortcoming and pointed out the need for a better understanding of why coaching can make a difference in senior managers' behaviour. In other terms, there is a need to learn more about coaching's complex properties, how do they turn into "great" leadership and how does better leadership make the company more efficient?

Coaching is defined differently. Some have stressed the consultant-executive relationship [21]-[22], while others have viewed it as a gradual process through which a person develops and becomes more effective [23]. The coaching literature currently discusses whether the feedback should come from a professional consultant trained in coaching techniques with little or no business knowledge [24]-[25] or from a coach with relevant business knowledge [26]. Clearly all forms of knowledge can be beneficial and there is no reason to treat them as mutually exclusive. In fact, the literature also perceives coaching as a dyadic feature. Again, there is no reason to assume that the coaching process has to be one-on-one; it can be in a small group. Indeed our study is based on the small group setting for coaching.

III. STUDY BACKGROUND

The selected organization is a large multi-national high tech (LHT) company, with over 30,000 employees. The organization is designed as a combination of functional, matrix and product structures. The LHT is functionally designed, but, when new products were introduced, cross-functional teams operated in a matrix structure, and

new product lines operates much more autonomously compared to the older functional units. The hierarchy structure has several VPs reporting to CEO forming the upper level of the management. There are approximately 700 directors reporting to the VPs who are responsible for various functional outcomes. Each director supervises several associate directors and managers who in turn look after projects, programs, and personnel working in their teams.

The LHT was a bureaucratic organization with a huge number of rules and procedures for dealing with any situation at work. The geographical layout of the company, the organizational commitment to being "high-tech," and prospects of reducing the cost of downtown offices resulted in relying on communication by emails and launch of work from home options. Most meetings took place via phone conferences and work teams were often operating virtually.

The culture change program we investigated was designed for the directors of the company with the assumption that culture change at this hierarchal level will have a significant impact in changing the culture of the organization. This is based on the desire to use the directors as agents of culture change within their business units to spread out the change throughout the company.

The program was designed in collaboration with the HR department and a reputed consulting firm. The HR department conducted initial interviews of a few directors across different functional areas and identified a number of behavioural dimensions that are viewed as unproductive. These behaviours include:

- Excessive compromises during decision making;
- risk avoidance;
- inability to form a clear perception of the problems at hand;
- inability to perceive the importance of other cross-functional, interdependent processes that affect their projects, and
- lack of personal interactions with team members.

The postulation is that if these habits are unproductive then "high performance" activities have to be the opposites. Thus, the following five behavioral aspects are identified as beneficial qualities of a high performing leader to the supervisors during the training session:

- To be decisive even if there is opposition (decisiveness);
- To be able to take reasonable risks (risk taking);
- To be able reach a clear understanding of various dimensions of the project from the beginning. (onset clarification);
- To be able to learn and understand the interdependent processes needed for project completion (process understanding), and
- To be able to develop intense interpersonal relationships within the teams (relationship building).

During the training, the directors were asked to assess their competence on each of the five behavioural dimensions and prompted to select two of the five dimensions that they perceive requiring improvement. Each participant director selected a project each on which they are currently working and requested to concentrate on improving the selected behavioural dimensions related to that project for the next 12 weeks. The directors assessed their competency on the behavioural dimensions on weeks 6 and 12. Feedback questionnaires were distributed to their teams. Finally, two telephonic conferences were scheduled for the entire pilot group during the weeks of 6 and 12 to discuss the features of the training and to provide feedback to the program organizers.

By the completion of the training session, all directors were allocated to different groups, dubbed the "coaching circle," which contained five to nine other company members. Coaching circles were scheduled to meet biweekly and it was planned that the directors should discuss their experience in applying the relational aspects changes and instead seek guidance from their colleagues. They have been taught that good coaching means raising questions, rather than offering answers, and helping a person to understand the root cause of the issue and/or possible solutions on their own.

As researchers, we did not participate in the identification of the dysfunctional behaviours or in the design of the training program itself. We were invited by the LHT as independent investigators to examine the training effects on the pilot group of senior managers with the intention to add value to the learning process through our investigations.

IV. METHODOLOGY

The study was conducted in two phases: at the beginning of the training, we participated and observed one of the training sessions (phase 1), and after eight months, we conducted a series of in-depth interviews with 19 directors (phase 2). Throughout the duration of the training, the HR Department provided us with the Directors' self-assessment and attendance data. Thus, the data for the study came from three different sources: the training observations, the data provided by the organization and in-depth interviews with the directors.

Phase 1: Observations during the training session

The pilot group consisted of 45 directors. They were trained in small groups of about seven participants in half-day workshops, followed by a 12-week peer coaching support group activity.

At the beginning of the workshop each director received a booklet containing the training material. The material included three self-assessment questionnaires to be completed on weeks 1, 6, and 12 of the training; a sample feedback questionnaire for directors' teams, and a description of typical and dysfunctional behaviours observed in the organization and their high performance counterparts. There were also templates for self assessment of behavioural dimensions and information regarding the coaching circle set

up including expectations and instructions for effective coaching.

The training was presented by one of the directors of the culture change program. She addressed issues such as the changing external environment, increasing competitiveness of the market, the LHT's loss of market share, the necessity of reducing costs, and becoming more efficient and competitive. For all of this to be achieved, the LHT's culture and the way they were used to doing things had to change. Since a lot was on the shoulders of the directors, a promising way of turning the company around was through helping the directors to become "high performing" leaders. Then, a considerable amount of time was spent describing the dysfunctional behaviours and their "root causes." The five desirable behavioural dimensions described in the previous section were presented as means of overcoming the current inefficient culture in the organization.

Towards the end of the study, the directors performed their first self-assessment test on their competency across the five appropriate functional aspects and chose two of those aspects to be strengthened over the next 12 weeks. The training session ended with having directors to sign up for one of the coaching groups (five to ten directors per party) and recruiting people to guide the coaching party.

During the next 12 weeks, the directors were expected to relate, apply and improve their chosen behavioural dimensions to the projects they were working on, meet with their coaching groups to discuss the challenges they encountered and received peer coaching.

The head of each coaching circle is responsible for organizing bi-weekly meetings and initiating conversations during the five coaching circle sessions. Coaching circles were developed as a type of peer support network to the administrators where they could discuss their challenges in solving behavioral aspects and seek coaching. It was planned that directors will give guidance and provide guidance. Coachee should be willing to seek feedback anytime they had an issue and required support. One of the persons was serving as "coachee" throughout the coaching phase and discussed his / her concerns with the rest of the party. The group was expected to be coached by asking "coaching" questions as opposed to providing solutions.

During the training workshop, the directors received instructions on how to provide effective coaching. They were told that "coaching" is NOT "telling," that is, the coach is supposed to encourage the "trainees" to get a better understanding of their own problems and finding solutions in consultation within the group, instead of receiving a prescription how to do it. The directors were instructed to ask coaching questions like: "Can you tell me more about that?"; "How do you feel about that?"; "Do you really believe that?"; "What do you really need?"; and "What results do you want to achieve?"

The method of coaching selected by the LHT is rather unlike conventional coaching methods presented in literature. It can be said though that the LHT members of the pilot group didn't have previous training on coaching or in how train others. They were provided with just an overview of the principles of coaching and a collection of coaching queries. None of the participants is actually a professional mentor, just a group of directors who had common challenges and difficulties with their job setting. The partnership inside the coaching cycles became that of one coachee to multiple coaches, and each individual had opportunities to play both roles during the same coaching circle session.

The culture change initiative imposed several constraints on the participants:

- the directors were expected to adjust their behaviour based on the given description of the desirable "high-performing" dimensions without any other adjustment in their work environment;
- the directors were expected to allocate 1.5 hours every other week for their coaching circle meetings and attend them;
- during the meetings, the directors were expected to keep their discussion around application of the behavioural dimensions;
- during the coaching circle meetings the directors were expected to adhere to coaching techniques described in their booklet and use a list of appropriate "coaching" questions.

Meeting with their coaching circles became a part of the directors' schedule, and it became the only "hard constraint" for them. All other requirements were simply guidelines for the directors to adjust their behaviour in a desired manner, and these could be seen as "soft constraints" compared to a more explicit adjustment to the directors' schedule.

Phase 2: Post-implementation Interviews

The major bulk of the data in this study came from the in-depth interviews that were conducted. Through the interviews we wanted to get a better understanding of what happened in the coaching circles which were set up as a support function for learning the high performing behavioural dimensions. In the interview, we asked the directors to provide specific examples of the helpful and unhelpful events that took place in their coaching groups. We also asked the directors to provide examples of the situations which they learned to handle more effectively because of the training and to comment on the aspects of their environment which hindered application of the training.

The interview questions were designed based on the Echo interview methodology. The methodology is particularly useful in studying organizational culture [27], since it was originally designed to get at group ideology [28]. The Echo approach has been successfully applied in various studies of organizations as in [29], [30], [31], and [10]. The advantage of this approach is that the participants are encouraged to

provide concrete examples instead of more abstract and potentially vague responses.

Participants. We interviewed 19 directors from five different functional units. The HR department selected these directors for our study from the original pool of based on the completion of the training program. Average experience of our participants in the role of a director was 2.4 years, while the average tenure in the organization was 15 years.

Procedure. The interviews were conducted in-person. Most were face to face, while the directors from distant locations were contacted over phone. Each interview lasted about 90 minutes and recorded with permission for analysis. Each interview began with a set of general background questions, followed by a set of specific questions pertaining to the training program, its effect on their performance and their coaching circle experience.

The transcripts contained 5,776 lines of text. They were analyzed line by line by the two researchers independently and comments for each question were categorized based on their similarity. The comments for each question were grouped into general level themes, which were then broken down into several distinct categories within each theme based on the agreement between the coders. The analysis was performed using the N6 software for qualitative data analysis (QSR International Pty. Ltd. 2002). Below, we report the themes and the categories within each theme, the percent of comments for each theme and category, and the examples of typical comments.

V. FINDINGS AND DISCUSSIONS

Training outcomes

Overall performance improvement. During the interviews, we asked the participants to indicate whether there was a change in their overall performance level as the result of their participation in the training program on a 10-point scale ranging from "-5" to "5." Negative values on the scale represented the extent of being less effective, positive numbers represented the extent of being more effective, and "0" represented no change compared to their performance prior to the training. All directors indicated an improvement in their performance. The average reported improvement was 3.0 ($\sigma = 0.9$).

These results were consistent with the data collected by the organization five months earlier, independent of our study. The pilot group's self-assessment on the behavioural dimensions at the end of the training program showed significant improvement relative to the beginning of the program ($\chi^2 = 23.9, p < 0.05$).

Improvement on the behavioural dimensions. At the beginning of the training, each director selected two of the five dimensions to improve upon. To remind the reader, the dimensions were decisiveness, risk taking, onset clarification, process understanding, and relationship building. During the interviews, we asked the directors to

provide examples of the ways in which they had become more effective. The examples were categorised based on the behavioural dimensions. The most number of examples of improved effectiveness were reported on the relationship building dimension, followed by the onset clarity dimension. The least number of examples were reported on the risk taking and decisiveness dimensions.

More than half of the participants at the beginning of the training course chose "decisiveness" as one of the unproductive habits to be improved at the beginning of the training program; but only 11 percent of the executives offered examples when they were asked to give examples of scenarios demonstrating habits developed and showed increased performance. This finding was in line with the results from the organization's own self-evaluation, where the decisiveness aspect at the end of 12 weeks demonstrated the least progress. There have been only few cases of risk management and it has never been preferred.

The directors reported that on an average it was easy for them to apply the behavioural dimensions in 60% of their work situations. The directors attributed the ease of application to situations which were under their control (e.g. relationship building within their teams), and to work with other directors who received the same training (e.g. onset clarity). The difficulties in application were associated with hard constraints, such as:

- the necessity to challenge the hierarchy to impose your decision (e.g. decisiveness);
- dealing with people who have not received the training;
- attending to frequent crisis situations;
- complexity of the existing processes affecting comprehension (e.g. process understanding), and
- Highly distributed workforce affecting personal relationships.

Coaching circles experience

The only hard constraint placed on the directors in this training was to attend their coaching circle meetings. Coaching circles were a major part of the training and was the mechanism that facilitated the moving and refreezing stages [8] of the culture change program. As we indicated above, this approach to coaching where peers with no previous coaching experience provided coaching to each other was unlike the more traditional executive coaching found in the literature.

In order to understand the directors' experience with their coaching circles, we asked them to provide examples of supportive and unsupportive aspects of their coaching circle experience. Overall, the directors freely provided 87 supportive and 30 unsupportive instances of the coaching circle events or every unhelpful example was matched with almost three helpful examples. We put all the supportive examples from the coaching circles into four general themes: interactions in the coaching circle, being generally a positive experience, attitude towards coaching circle meetings, and comments specific to the training program. Table I lists the

categories within each of these themes, reports percentage of comments for each category, and provides a typical comment for each category.

Table I: Summary of comments regarding the helpful aspects of the Coaching Circles (CC)

Theme	Category	% of comments
1. Interactions in the CC (39%)	1.1 Consulting, helping with issues	19%
	1.2 Networking/ meeting new people	12%
	1.3 Learning about the company	9%
2. Positive experience (30%)	2.1 Enjoyment	8%
	2.2 Openness	7%
	2.3 Sense of community/ therapeutic	7%
	2.4 Valuable/ Not a waste of time	6%
3. Attitude toward the CC meetings (16%)	3.1 Extending meetings beyond the 12 weeks	13%
	3.2 Desire to continue CCs	4%
4. Training specific comments (15%)	4.1 Reinforcing the behavioural dimensions from training	8%
	4.2 Coaching experience	7%

Table I shows that 85% of the comments were related to interactions, positive experience, and positive attitude. Only 15% of the comments were directly related to training. Within the theme of 'interactions within the coaching circles,' the 'consulting/ helping with issues' category had the highest percentage of comments, followed by the 'networking/ meeting new people' and 'learning about the company' categories. The comments for the theme 'positive experience' were evenly distributed among four categories of 'enjoyment,' 'openness,' 'sense of community/therapeutic,' and 'valuable/not a waste of time.' For the theme 'attitude toward coaching circle meetings,' most of the comments were made by those who continued their coaching circle meetings beyond the required 12-week period and a few others expressed interest to resume their coaching circle meetings. The comments for the theme 'training specific comments' were equally distributed between two categories of 'reinforcing the behavioural dimensions from the training' and 'coaching experience.'

Table II reports the summary of the comments regarding the unhelpful aspects of the coaching circles which were much less frequent than the helpful comments.

Table II: Summary of comments regarding the unhelpful aspects of the CC

Theme	Category	% of comments
1. Directors' busy schedule (50%)	1.1 Scheduling/ time allocation difficulty	33%
	1.2 Too many dimensions to work on	10%
	1.3 Multitasking during calls	7%
2. Deviation from the intended objectives (30%)	2.1 Venting Sessions	13%
	2.2 Irrelevant issues	13%
	2.3 Lack of focus on personal development	3%
3. Implementation issues (20%)	3.1 Bumpy start in CC	10%
	3.2 Disciplines lack concrete actions	3%
	3.3 No openness	3%
	3.4 Short duration/too few meetings	3%

For the theme of ‘directors’ busy schedule,’ which constituted 50% of the comments, the most frequently mentioned difficulties were issues related to scheduling the coaching circle meetings and time allocations, followed by ‘too many dimensions to work on’ and the least number of comments were related to multitasking during the meetings. It is interesting to note that the concerns related to scheduling were also echoed by the coaching circle attendance data collected by the HR department. Even though, the pilot group of directors were volunteers, the attendance of the coaching circle meetings was not perfect. The average number of missed coaching meetings per individual in all groups was 1.4 (28% of the total number of meetings). From our interviews, the participation in the coaching circles was sometimes abandoned due to other pressing issues.

For the theme ‘deviation from intended objectives,’ which constituted 30% of the comments, the two frequently mentioned categories were ‘venting sessions’ and ‘irrelevant issues’ followed by ‘lack of focus on personal development.’ Finally, for the theme ‘implementation issues,’ the most frequently mentioned category was ‘bumpy start in the coaching circles’ followed by ‘disciplines lack concrete actions,’ ‘no openness,’ and ‘short duration and too few meetings.’

Overall, there were more helpful comments (47 comments) than unhelpful comments (6 comments), indicating highly positive working relationship between peers from the same coaching circle. The majority of the helpful comments were related to providing consultations, sharing ideas with each

other, supporting each other, having very positive reciprocal relationship, and resolving work-related issues. Some directors also indicated that shared training tools and intense communication with their coaching circle peers were also helpful in their working relationship (11% of the comments).

The most common negative comment was related to missing the due dates for their deliverables (50% of the unhelpful comments) and the remaining three comments were diverse.

89% of the directors indicated that participation in the training program, especially in the same coaching circle, had a positive impact on their working relationship with their peers. 88% attributed this improvement to building a personal relationship and getting closer with their colleagues in the coaching circle, while 29% pointed out that sharing the same language and tools from the training helped to improve their working relationships.

Overall, 68% of the directors placed their coaching circle colleagues at a higher level than other directors in the company for their task related interactions, while 32% reported no difference between the two groups.

Theoretically, we have argued that the hard constraint that played a significant role in the emergence of the coaching circle culture was the fact that the directors had to meet and discuss their problems in adopting their chosen behavioural dimensions. The softer constraints such as the instructions about how to coach and to keep their discussion on the behavioural dimensions were either not followed at all, or not followed very rigidly. One possible explanation is that the instructions were not appropriate for the setting. For example, it is difficult to play the role of a coach when you have knowledge and experience on the topic of the discussion and the “trainee” is asking for your advice. It is much easier to limit yourself to coaching questions when you are not familiar with the business and the intricacies of the problem at hand. Similarly, to discuss problems of ‘being decisive’ requires a description of the situation which is far more complex than simply exerting your will upon others in a group. It is worth pointing out that [1] and [26] explained their findings on “culture change” among managers in terms of hard constraints of organizational restructuring tended to reduce autonomy and create a more centralized organization as opposed to changes in values of the managers.

Most definitions of culture emphasize psychological properties within the person (values beliefs, assumptions and so on) as in [32], [33], [34], [35], and [36]. Some researchers include the importance of the physical objects [37], but, none of the definitions of culture are based on the most fundamental property of organizations, namely, how work gets divided and how sub-cultures emerge as the result of required task dependent social interactions which in turn modifies the formal task structure into the one that is actually performed [38]. Consider, for example, the concept of “sharing” within a “group” which is the source of dispute among some schools of culture [39]. What make a collection of people into a group? And what is the pattern of

expectations in their social structure? From the point of view of task dependent social structure, the properties of the group and their expectations will depend, in part, on the type of interdependencies [40] between interconnected tasks and their distribution over those people. For instance, reciprocal interdependence between two tasks is more likely to lead to a stronger culture of “sharing” than sequential arrangement of tasks. We argue that the definition of these constructs like “sharing” require their mapping to the organizational situation from which they were abstracted. Reference [41] put it “... any item of cultural behaviour must be understood in relation to the culture from which it comes, and that, torn of its context, it is meaningless” (p. viii).

Lewin’s theory of change is also related to hard constraints as he was a strong advocate of understanding human behaviour as a function of total situation. Thus the notions of unfreezing and refreezing are not simply instructions or attitude adjustments but rather required changes in the hard constraints which defines a given work situation. The situational approach has been rediscovered. For example, [42] notion of “situated action” is an attempt in this direction. Unfreezing and refreezing (or lack of changes in the challenging constraints) are usually defined as the causes for the failure of a change training program, whereas we discuss here how a single challenging restriction resulted in an unexpected, yet beneficial, cultural aspect within the enterprise.

VI. CONCLUSIONS

There are a number of conclusions that can be drawn from this study. First, any attempt at culture change will be accompanied by unintended consequences. In our study the coaching circle culture emerged as a “counter-culture” where the norms of behaviour were honest discussions and mutual help to solve various problems. This was opposite to the LHT’s highly political culture characterized by hidden agendas, lack of trust, and lack of information sharing.

Second, the positive results of the coaching circle culture were, in part, due to the directors’ readiness for change. In other words, the directors were “unfrozen” and willing to try and learn new ways. It is important that our results are not interpreted as suggesting that a coaching circle within a small group will always result in a positive culture.

Third, we have used the construct of hard constraint as a crude theoretical notion to draw attention to the mapping between culture as a social system and the structural properties of the work situation. This mapping is often missing within the scholarly discussions of culture.

Fourthly, coaching can be carried out very productively in a small group environment. In fact, the study discovered that peer coaching can be an important way to communicate, understand and fix issues. The study also shows that the mutual form of confidence that was established within the community of directors led them to accept parochial concerns and cause a spirit of teamwork contributing to a productive consultative culture and team thought.

Additionally, the efforts to bring to push cultural change may not necessarily yield the desired effects, because participants cannot actively obey the charted course and may step through it without purpose as improvement is achieved by normal experiences of the participants.

The findings of the research may also be viewed as being able to cause the idea of controlled cultural change or official initiatives to shift cultures although the extent and essence of the transition depends on the casual experiences between participants taking place in a regulated training framework. In other words, cultural changes are unintended or leveraged consequences that deviate from intended outcomes.

VII. ACKNOWLEDGEMENT

The author of the paper would like to thank the University of Waterloo, ON, Canada, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia and Yanbu University College, Royal Commission for Yanbu Project, Saudi Arabia for their assistance.

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The Affordances of Augmented Reality Technology in the English for Specific Purposes Classroom: It's Impact on vocabulary learning and students motivation in a Saudi Higher Education Institution

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Abstract

The recent years have witnessed an unprecedented growth and innovation in information communication technology. One of the fields that has benefited immensely from these developments is education. Augmented reality (AR) technology is currently applied in English for Specific Purpose Classroom (ESP). AR technology comes with several advantages including more focused learning, improved motivation among learners, personalized learning and remote learning among others. However, questions have arisen on the efficacy of this approach. Using a Higher Education Institution in Saudi Arabia (private medicine school) as a case study, we target the students registered for this English for Specific Purposes (ESP) course who are all Saudi students. They are B1/B2 CEFR level. They are considered first year college students. We use Krejcie and Morgan sampling formula to get the required sample which is 144. Participants are then sampled using stratified sampling and purposive sampling methods. The study has both control and experiment groups. Mixed methods including questionnaires and interviews are used in data collection. The respective data is collected from 100 MCQs vocabulary questions. Descriptive statistics and content analysis are used in data analysis. The results indicate that although traditional vocabulary learning methods can improve students' performance, augmented reality technology still leads to better results. While most students in the control group scored less than 80 in the vocabulary questions, a majority of the students in the experiment group scored more than 90. On students' perception of the AR technology, students who strongly agreed were 124 while those who agreed were 18. This is an indication that AR technology impacts positively in learning motivation and vocabulary retention.

Keywords

Augmented Reality, AR technology, ESP, vocabulary learning, students' motivation

I. INTRODUCTION

1.1 Education and Technology

The 21st Century has witnessed an exponential growth in information communication technology. These developments have had a spill-over effect on virtually all fields including education. E-learning refers to the application of information technology in conveying education to learners. One such technologies is augmented reality (AR). According to Chang et al., the use of augmented reality in classrooms usually results into an engaging experience. This can be attributed to the examples and gaming elements inherent in this technology. This tends to support textbook materials. Consequently, the resulting interactivity enhances students' ability to remember the content they have learnt [1].

According to Chiang, Yang and Hwang, one of the learning areas that AR has been applied successfully is foreign language learning. The authors argue that vocabulary knowledge is an essential tool for second language learners

given that with limited vocabulary, learners' ability to communicate is impeded. AR incorporates virtual learning and as such, students are able to relate vocabulary learnt with images [2]. These findings are augmented by that of Yaacob et al. who argues that previously, flashcards were popular in teaching vocabulary [3]. However, they were rendered redundant with the invention of 2D flashcards and currently 4D flashcards which are a reflection of AR technology. The author attributes these shifts to the fact that the flashcards were boring and less attractive. AR technology, on the other hand, has been found to be more appealing vocabulary learning method. Nevertheless, Mena-Vargas, Millán-Rojas, and Sánchez-Castillo raises concerns that although augmented reality has attracted a lot of attention and research, there is still a large deficit in trained teachers who can successfully apply augmented reality in teaching vocabulary [4]. Similar deficit has also been witnessed in the availability of technicians to develop AR technology [1] [3] [4].

From these previous researchers, it is evident that augmented reality technology is relatively new approach in vocabulary learning [4]. This paper is a case study of augmented reality technology in vocabulary learning among medical students in a medical school in Saudi Arabia. As such, we seek to empirically establish the differences in student learning motivation and vocabulary learning with and without the use of AR mobile technology, and health services students' perceptions about AR technology in English for Specific Purposes (ESP) class. The paper further researches on the differences between traditional teaching and AR language classes. Ultimately, we seek to establish the impact of using AR technology in the ESP classroom in terms of vocabulary learning and retention. The paper is sectioned into six main parts. Subsequently, the next section discusses affordance of augmented reality technology and the independent study variables. The third section discuss the methodology followed by a section on findings and analysis. Consequently, discussion and conclusion sections wrap up the paper.

1.2 Affordances of Augmented Reality Technology (AR)

Scrivner et al. defines augmented reality as real time indirect view of the real world buttressed by virtual computer generated information [5]. Affordances refers to the potential benefits that a learner can gain from using AR technology. According to Bonner and Reinders, the single most important benefit of AR for students' is its ability to reduce distractions [6]. This is achieved by blocking out visual and auditory distractions that might exist within the classroom. As a result, learners are able to connect with the study materials deeply. To augment these findings, Yaacob et al. argues that this level of immersion helps learners to make connections between the vocabulary they have learnt and the real world [3].

Another feature of AR technology which gives it an edge over previous approaches is that it incorporates mobile technologies. According to Chang et al. this portability means that learners can use this technology within both formal and informal settings to the advantage of learners [1]. In second language learning, AR technology facilitates social interactivity which is a prerogative for collaborative learning [5] [6]. This is achieved when students hold discussions within the technology. In affirming these findings, Chiang et al. argues that in addition to collaborative learning, AR offers context sensitivity which enhances situation learning [2]. Learners are also more connected to their teachers and learning resources. This facilitates personalized learning as learners are able to focus on their individual preferences. This is further enhanced by the fact that learners are able to participate in coordinated construction of their learning experience by posting questions and comments pertaining to their learning location and experiences. This is further augmented by just-in-time learning where teachers are able to open the classroom and offer remote assistance to learners [3] [4] [6]. This study adopts affordances of AR technology as a framework within which other variables of this study will be anchored. The proposed variables for the study are presented in the subsequent sub sections.

II. Literature Review

The study adopts an intuitive approach given that it is reliable in joining intuition to intellectual precision. This will help enhance readers' understanding

2.1 Student Learning Motivation and AR Technology

In their study on how technology can be used in learning second language vocabulary, Horno-Chéliz and Sarasa-Cabezuelo identify lack of motivation among learners as an impediment to perseverance [7]. This usually translates into dismal learning outcomes contrary to both learners and teachers' expectations. Consequently, effective learning strategies coupled with suitable computer technology is essential in increasing learning motivation. According to Chiang, Yang and Hwang, the best approach involves supplementing inquiry-based learning with computer technology in a scenario-based learning environment [8]. This is buttressed by Bonner and Reinders who in their findings argue that the use of AR technology in learning language needs to emphasize on interactions between the learning technology being used and the actual environment. This approach is likely to translate into increased learning motivation given that student-centered knowledge exploration activities are incorporated. As such, students are able to learn proactively. These sentiments are echoed in a study by Vargas et al. who emphasize the need for digital learning aids with real-life scenarios in enhancement of learning motivation [4].

Accordingly, with AR technology, learners are able to incorporate personal knowledge in the learning process. For instance, in the context of this study, students can chose a virtual learning tool from the actual medical environment with the help of a mobile learning aid and consequently improve their learning motivations. From previous researches that have investigated the role of AR technology in learners' motivation, results have indicated that compared to traditional learning approaches, the technology contributes immensely to improved academic achievement [3] [5] [7]. However, homogenous results have not been achieved considering that the success of AR technology is dependent on the levels of learners' sensory experience. As such, this study seeks to establish the differences in student learning motivation and vocabulary learning with and without the use of AR mobile technology in the study sample. As such, the following research question suffice;

RQ1: What are the differences in student learning motivation and vocabulary learning with and without the use of AR mobile technology?

2.2 Perceptions of ESP Classes using AR Technology

Scrivner et al. defines English for Specific Purposes (ESP) as a learner-centered approach to teaching English as an additional language. This is rationalized by the fact that communicative competence is essential in professional undertakings [5]. For instance, in our case, medical professionals' competence in English is a prerogative for learning new approaches in medicine and patient diagnosis in multicultural setups. ESP has distinctive features from English language courses given that they are designed to meet specific needs of learners, are focused on particular disciplines and seek to advance intercultural competency among learners [2] [7].

Asmali notes that language changes from one context to the other. As such, it is essential to employ activities and materials that takes learners' need and wants into consideration [8]. For this reason, ESP teachers have integrated technology in these classes. Asmali's observations are buttressed by those of Chiang et al. whose study focused on the impact of technology on ESP [2]. The study's findings indicate that the integration of technology in ESP curriculum avails myriad opportunities and advantages for professionals. Some of the benefits identified include enhanced interactive and communicative activities [8]. The other advantages of application of technology in ESP is the availability of feedback and self-evaluation on the feedback on a specific context. ESP learning among health science students is supported with AR technology. Kamphuis et al. argues that this paradigm shift can be attributed to the technology's ability to facilitate ubiquity and collaboration in situated learning [9]. As such, learners are able to immerse themselves in the learning process. The end result is meaningful learning that is an essential precondition for professional competence. In their research on health science students' perception on AR technology, Hung, Chen and Huang acknowledges that AR technology has immensely improved the learning performance among students [2]. As such, they are more motivated and perceive AR as an essential component of learning. These findings are in tandem with studies that recommend AR technology as a strategy for improving student concentration [3] [5] [6]. In this study we seek to establish the how health science students perceive the use of ESP classes learnt using augmented reality technology. Based on empirical results, the research question below will be addressed;

RQ2: How do health science students perceive the use of AR technology in English for Specific Purposes class?

2.3 Traditional teaching vs. Teaching by Augmented Reality (AR)

Since the introduction of augmented reality technology in the learning spheres, researchers have been attracted to establishing whether this approach has advantages over traditional technologies used in the same manner [4] [6] [10]. One of the areas that has experienced immense contributions in this context in the use of AR technology in English for Specific Purposes (ESP) classes. According to Carmigniani et al., vocabulary is the most important aspect of a language that has to acquire. This is because communication aspects such as reading, listening, and speaking are usually influenced by ones' vocabulary competence [11]. As such, it is essential to identify a learning medium that will enhance vocabulary retention. Saidin, Halim and Yahaya argues that compared to traditional technologies such as 2D, augmented reality technology incorporates virtual learning enabling students to relate vocabulary with images [12]. Previously used traditional teaching have also been shunned for being boring and less attractive. According to Yilmaz et al. another advantage of AR over traditional technologies used in learning is its ability to block auditory distractions that are likely to arise in the classroom setup. This gives learners an opportunity for deeper learning which is essential in learning a second language [13]. In this context, such deep immersion

helps learners to relate the vocabulary they have learnt with the real world [9] [12].

Further, AR technology has been adopted for its ability to incorporate mobile technologies. Unlike past technologies adopted in ESP classes, AR is portable. As such, students are empowered to use this technology in both formal and informal settings. According to Carmigniani et al, this is advantageous to medical students given that they are expected to be highly competent. As such, at their private time, regardless of their location, they are able to learn seamlessly [11]. Hsu's contributions to this subject also indicate that AR technology usually facilitates social interactive which is essential in collaborative learning [14]. In this approach, students hold discussions within the technology. This could not be achieved with traditional technologies used in learning. Another notable advantage of AR is that learners have unperturbed access to learning resources. This enhances personalized learning among them given their preferences, especially vocabulary aspects that they are yet to grasp. The fact that students can make comments and ask questions, which are answered remotely by teachers, on this platform also augments their learning experiences [9] [14] [15].

Subsequently, it is essential to empirically assess whether there is any significant difference between traditional teaching and augmented reality teaching in language classes. As such, the research question below will be addressed;

RQ3: Is there any significant difference found between teaching using traditional teaching methods versus teaching with Augmented Reality Technology (AR) in language classes?

2.4 Impact of Augmented Reality Technology on Vocabulary Learning and Retention

According to Sandberg, Maris, and Hoogendoorn, vocabulary learning and retention is an essential aspect of English for Specific Purposes (ESP) Classes [15]. The author further opines that although ESP is a critical requirement in professional development, learners find it difficult in the absence of a friendly learning strategy. This explains constant efforts in development of learning resources for use in vocabulary learning. In their work on the use of AR flashcards in learning vocabulary among children, Chen and Chan argue that flashcards have evolved over the years as common vocabulary instructions tools [16]. The authors classify these flashcards as traditional paper flashcards, virtual flashcards and AR flashcards [14] [15] [16].

These findings are buttressed by those of Ke and Hsu who argue that traditional paper flashcards had images and words associated with them. However, these were faced out with virtual flashcards which are comparatively more interactive and engaging in teaching vocabulary. These come in different formats and are run on mobile devices. In ESP classrooms, this approach was adopted given that it also incorporated pronunciations, videos and animation. As such, they enrich the learning experience translating into better vocabulary learning and retention [15] [16] [17].

AR flashcards are the most recent innovation in this front. According to Özcan, Özkan, and Sahin, this technology superimposes virtual objects with the real world [18]. Consequently, learners rely on mobile devices to learn from

the virtual features. The learning content is presented in 3D perspective. The AR application also has games, simulations and models which help in ensuring ubiquity and collaboration in learning. According to Madini and Alshaikhi, this mix of real and multimedia contents, AR systems are able to offer learners immersion and immediacy. This improves the learners' ability to learn and retain vocabulary [19]. The authors further remark that this further supplements the textbooks used in teaching learners and can be a reliable approach in remote learning. A study by Alizadeh harmonizes these findings by indicating that AR technology supports book reading in ESP classrooms resulting into enhanced interactivity and appeal [20]. The author further remarks that this increases motivation among learners and draw their attention towards real life experiences that correspond to the vocabulary being learnt. This makes learning more authentic and relevant hence increased learners' performance. However, there are also literary contributions that hold a contrary opinion [13] [17]. Ke and Hsu for instance, argues that AR technology is still new and as such, fewer teachers and even learners are competent in its use in learning [17]. As such, it is highly unlikely that it can enhance vocabulary and retention. This study seeks to empirically establish the impact of augmented reality technology in vocabulary learning and retention for medical students. As such, the following research question will be addressed;

RQ4: What is the impact of using Augmented Reality technology in the ESP classroom in terms of vocabulary learning and retention?

III. Methodology

This study adopts mixed research method in assessing the impact of augmented reality technology in vocabulary learning and students' motivation. According to Alavi and Håbek, mixed research methods is a research design that combines both qualitative and quantitative approaches [21]. Qualitative approaches are used in analyzing existing literature on application of augmented reality technology in vocabulary learning while quantitative approaches are applied in empirical analysis of the data collected for this study. Within mixed research approach, there exists various research designs including triangulation design, the embedded design, the explanatory design, and the exploratory design. This study adopts triangulation research design. Turner, Cardinal, and Burton defines triangulation design as the use of more than one method in data collection [22]. The choice of triangulation design is also informed by the fact that it assures validity of the research results. The design also accommodates different samples, in this case, the control and the experiment groups. As such, this design enables actualization of the four research questions identified for this study through questionnaires and interviews [21] [22]. Subsequently, the impact of augmented reality technology on vocabulary learning and students' motivation is assessed holistically. Ultimately, more informed discussions and conclusions are drawn from the study.

3.1 Population and Sampling

The study population was drawn from a Higher Education Institution in Saudi Arabia that specializes in offering

medical courses. Specifically, we focused on male students who had registered for English for Specific Purpose (ESP) course. The targeted students also had to be in B1/B2 CEFR level. Students in this level are an equivalent to first year college students. The total number of students that met this description were 230. This meant that the study population was finite. As such, Krejcie and Morgan sampling formula for finite study populations was used. Krejcie and Morgan table is attached as appendix 1 [23].

$$S = \frac{X^2 NP(1-p)}{d^2(N-1) + X^2 P(1-P)}$$

Where:

S = Required Sample size

X = Z value (e.g. 1.96 for 95% confidence level)

N = Population Size (230)

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%))

d = Degree of accuracy (5%), expressed as a proportion (.05); It is margin of error

$$S = \frac{1.96^2 \times 230 \times 0.5(1-0.5)}{0.05^2(230-1) + 1.96^2 \times 0.5(1-0.5)} = 144$$

As such, 144 students qualified to participate in the study. Subsequently, we proceeded to sample the study participants. The first sampling method that we applied was stratified sampling. In this approach, two strata were formed. These included the control group and the experiment groups. These categorizations were based on the teaching techniques used in the study. The experiment group consisted of students who used AR technology in their ESP classes. The control group used traditional learning methods including paper flashcards and notes. Each of the stratum had a proportionate representation given the required study sample.

Purposive sampling was used in choosing research subjects in the two strata. According to Sharma, purposive sampling is also known as judgmental sampling [24]. It is a non-probability sampling technique where the study participants are selected based on the judgment of the researcher. As such, the researcher applied this approach in identifying participants to be included in both the control and the experiment groups. The experiment group had 72 participants using AR technology in their ESP classes. This experimental group used the Learning Alive Augmented Reality Application. The researcher ensured that the students chose the application's Letters Alive option, which is largely used in literacy lessons. This also consisted of digital 3D flashcards. For the anatomy classes, Human Anatomy Atlas by Visible Body was used by the experiment group. This AR tool was used in teaching the students about the human body, the skeletal structure and the muscle composition. The use of the application was justified by the fact that it can go in-depth with 3D models of the human body. The control group, which consisted of students using traditional learning methods, made up the remaining 72 participants. In the literacy classes, this group was taught using paper flashcards, and they were expected to take notes. For the anatomy classes, they were taught using photographs of the parts of the body including the skeletal structure and the muscle composition.

3.2 Data Collection

Being a mixed research, we used both primary and secondary data in answering the research questions [21] [22]. Secondary data was obtained from previous studies that compare traditional learning methods and augmented reality technology. First hand data was obtained from data collected from the students through interviews and questionnaire. The entry point for data collection was the questionnaires which was administered to all the 144 students participating in the study.

Brown buttresses researches which argue questionnaires are most appropriate when using mixed methodology. This is attributed to the fact that it helps in quantifying findings for a study [21] [22] [25]. We distributed the questionnaires which contained both closed-ended and open-ended questions. The questionnaires assessed; learners' perception of augmented reality technology, perceptions of ease of use of the AR technology or traditional methods, the flow achieved when using AR technology or traditional methods, perceived playfulness of the AR technology or traditional methods, the levels of enjoyment in these forms of ESP classroom learning and satisfaction levels. Evidently, this approach helped us cover a wide area within a short time. Another justification for the approach was that respondents were able to express themselves freely [21] [22] [25] [26]. Since this approach relies absolute on the honesty and accuracy of the participants' responses, we combined it with interviews to yield trusted results.

Interviews were conducted to mitigate the negative effects of questionnaires. According to Wilson, Onwuegbuzie, and Manning, interviews are dependable in obtaining information about personal feelings, and perceptions of the 144 students [27]. The use of interviews was also justified by the fact that we were able to ask more detailed questions and seek clarifications on the incomplete answers obtained from the questionnaires [24] [27]. Similarly, the respective data was collected from 100 MCQs vocabulary questions. This also consisted of 20 items in the Technology Perception Questionnaire. Some of the factors that the questionnaire interrogated include perceived learning whereby they were expected to state whether AR had allowed them to learn faster and increased their learning efficiency. Still on perceived learning, they were also expected to answer whether AR had increased their understanding of things learnt. On perceived ease of use, the learners were asked whether AR is easy to use and whether using AR to complete course related tasks was easier. The ease to complete tasks was also interrogated as one of the determinants of ease of use. Another aspect interrogated was the flow. This mainly focused on learners' satisfaction with the interactivity. On perceived playfulness of AR, the extent to which students feel happy when they use AR in learning was measured. There were also questions on enjoyment while using AR. Here, students were asked whether they had fun while using AR in learning English compared to traditional teaching approaches. Lastly, students' were satisfied with AR's role in supporting their English classes.

3.3 Data Analysis

The research generated both qualitative and quantitative information on the study objective which aimed at

establishing the impact of using augmented reality technology on English vocabulary learning and motivation. Information obtained from the questionnaires were quantitatively analyzed using SPSS version 21. Descriptive statistics were used in communicating research findings because they are able to summarize the basic features of standardized responses [26]. Tables and graphs were used to enhance understanding of the study results. For the qualitative data generated from the interviews conducted during the study, we used content analysis [21] [22]. From the analysis, we were able to reveal the key themes in understanding the impact of AR technology in ESP classrooms. Our analysis was justified by Mugenda and Mugenda recommendations that any response rate of more than 50% is enough for analysis and reporting [28]. Being a controlled study relying on questionnaires and interviews in collecting data, we were able to establish a 100% response rate from the 144 male students sampled in the study.

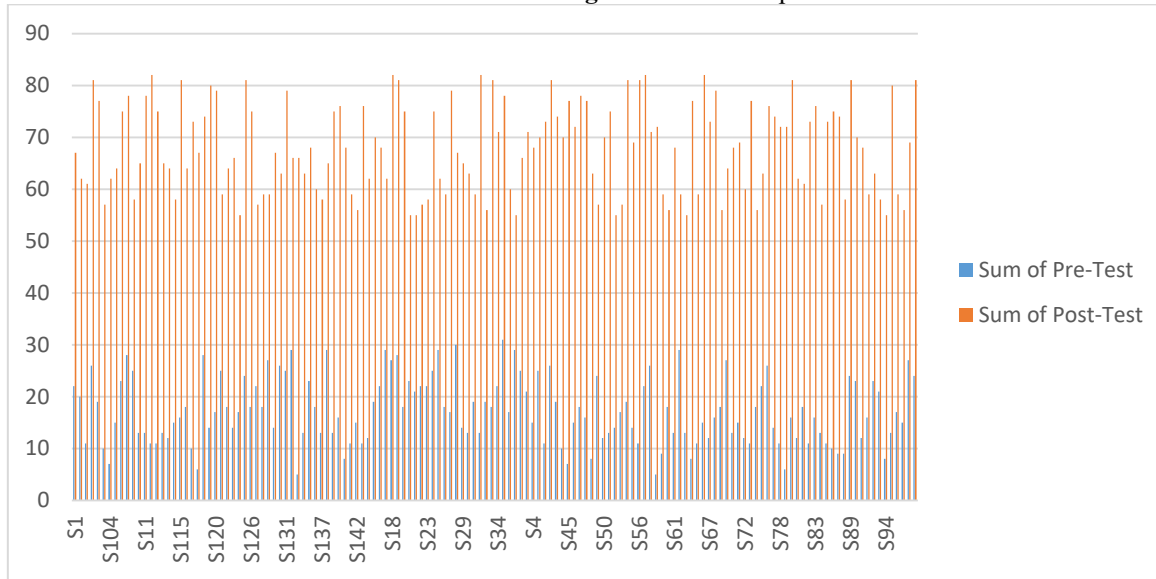
IV. Results/Findings and Analysis

The research objective was to establish the impact of using Augmented Reality (AR) technology on English vocabulary learning and motivation of Saudi private undergraduate health science students before and after using a particular AR mobile application. The subsequent sections discusses the findings for each of the research questions in this study.

4.1 Student Learning Motivation and AR Technology

The first research question entails assessing the differences in student learning motivation and vocabulary learning with and without the use of AR mobile technology. Subsequently, we graphically presented the sum of pre-test and the sum of post-test for both the control and experiment groups using SPSS.

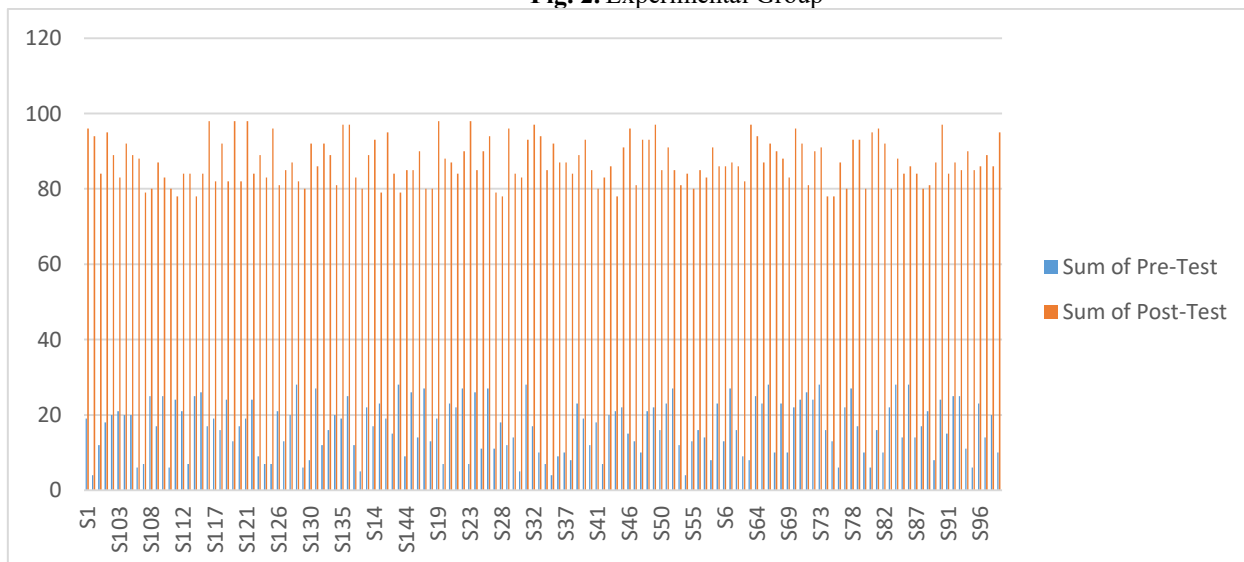
Fig. 1. Control Group



scores in the vocabulary test. These results were deduced from the graph where the blue bars represent the pre-test results while the red bars represent the post-test results.

From the graph, it is evident that the use of traditional learning methods in ESP classrooms contributed to higher

Fig. 2. Experimental Group



Purposes (ESP) class. We used descriptive statistics in analyzing data related to this question. As such, (M=124.35, S.D=9.626), was the result obtained from students who strongly agree. For students who agreed the results obtained included M=18.15 and S.D = 8.756. Students who remained neutral were represented by a mean of 2.31 and a standard deviation of 1.888. These results are summarized in the table below.

For the experiment group, students used AR technology in their ESP classrooms. Form the graph, it is evident that the students scored highly in post-test compared to the pre-test. This is evidenced in the red bars and the blue bars respectively. However, a comparison between the control group and experiment group indicates that despite that fact that there was a recorded improvement, the students using AR technology in their ESP classes scored highly compared to those using traditional approaches. For the control group, most students scored below 80 while for the experiment group, a majority of the students got more than 80 vocabulary questions right.

4.2 Perceptions of ESP Classes using AR Technology

The second research question assesses health science students' perceptions on the use of AR in English for Specific

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Strongly Agree	20	99	138	2487	124.35	9.626
Agree	20	4	37	363	18.15	8.756
Neutral	13	1	8	30	2.31	1.888
Disagree	0					
Strongly Disagree	0					
Valid N (listwise)	0					

4.3 Traditional teaching vs. Teaching by AR technology

The third research question’s objective was to establish if there was any significance difference between teaching with traditional methods as compared to teaching with Augmented

Reality Technology in language classes. ANOVA was used to establish a statistical significance test as to the equality of more than one group. In addition, the generalization of t-test to more than a group was significantly evident as per the table findings below.

Table 2. ANOVA^b (Control Group)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.474	1	.474	.012	.914 ^a
Residual	5813.276	142	40.939		
Total	5813.750	143			

a. Predictors: (Constant), PostTest_Control

b. Dependent Variable: PreTest_Control

Table 3. ANOVA^b (Experiment Group)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.644	1	.644	.013	.910 ^a
Residual	7078.683	142	49.850		
Total	7079.326	143			

a. Predictors: (Constant), PostTest_Experiment

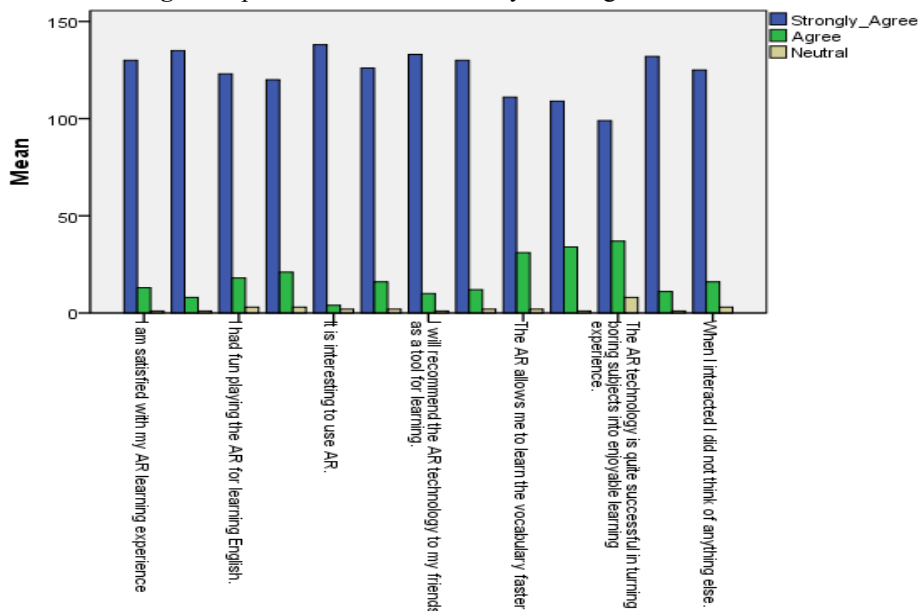
b. Dependent Variable: PreTest_Experiment

4.4 Impact of Augmented Reality Technology on Vocabulary Learning Retention

The summary finding shows a less than 0.05 significant (< 0.05) P value. This indicates that the both variables in the independent section that is traditional teaching and Augmented Reality technology together explain the degree of improved performance on the students test.

There is a significant impact in using Augmented Reality technology in the ESP classroom in terms of vocabulary learning and retention. This was evident by 129 students in experiment group who performed better than control group. However, 15 students in control group performed better than those in experiment group. In the overall observation, both groups performed better.

Fig. 3. Impact of AR on Vocabulary learning and Retention



As indicated in the methodology, qualitative results were generated from the interviews conducted with the students. Through coding, we were able to identify key themes relevant for the study. These themes included motivation,

perception, and retention. From the interviews, these themes featured in a majority of the responses. For instance in an interview with participant S126, when he was asked about his views on augmented reality technology in ESP classrooms, this answer sufficed:

In my view, AR technology is more interactive and convenient. This motivates me to learn even in the absence of my teacher. As a result, my vocabulary retention has improved considerably. I feel motivated to learn more.

Another participant commented on Augmented Reality in terms of its potential in reducing the cognitive load associated with learning new terminologies especially for non-native speakers of English. He commented:

Being a non-native speaker of English or Latin, learning and memorizing the names of body organs has been our worst nightmare because we work very hard in learning English before we study in college, and then we find that the language used in anatomy books is either Latin or Greek. Most of the time we find it demotivating to have to learn the prefixes and suffixes in other languages other than English. But with AR the story is different as learning what used to dull and boring has become interesting and enjoyable. I can now practice all day with my classmates and with my siblings at home.

Another participant found that using AR in the English classroom very convenient for his preferred learning style: I am a visual learner. I found the AR technology really interesting and motivating because I was able to visualize the new terminologies whenever I wanted. The exercises that I had to do later to check my learning helped me a lot and showed how fast I was able to recall the terms.

It was interesting see some participants taking the experience to a different level where they reported that they would look for similar applications of the AR technology to use them for their future learning endeavors:

I learn faster when I practice. When I used the AR technology I was leaning by doing and that was really helpful. I will definitely look for other applications for this technology in my future courses. I am sure there will be a lot out there and that will help me a lot during my journey studying medicine.

In light of these statements, all the three themes needed for coding arose. This responded to the research objective on whether augmented reality technology had impacted on vocabulary learning and students' motivation. Consistency in these themes was an indication that AR technology considerably impacted factors such as student motivation, vocabulary retention and learning perceptions.

V. DISCUSSION

The main objective of this study was to assess the impact augmented reality technology on vocabulary learning and student motivation. Subsequently, the first specific objective of the study was to establish whether there are differences in learning motivation and vocabulary learning with and without the use of AR mobile technology. From the analysis, it is evident that both the control and the experiment group students' learning motivation improved. However, students using AR technology posted better results compared to their counterparts using traditional methods. These results are in

tandem with previous researches which indicate that although traditional paper flashcards have been reliable tools in teaching vocabulary, augmented reality technology is a more appealing and interactive vocabulary learning method. For instance, studies by Bonner and Reinders which focused on the importance on the application of augmented reality in ESP classes indicate that traditional teaching methods such as paper flashcards present numerous challenges for students learning English as a second language [6]. The authors argue that vocabulary retention among such students can only be achieved when particular levels of practicability is achieved. This is not possible without the indulgence of an interactive teaching model. Kamphuis et al. in their contribution of AR technology learning in medical schools augments these outcomes by observing that human anatomy is complex and its vocabulary can only be learnt using a more interactive model [9]. The authors further observe that virtual reality gives students a sense of real-world learning which cannot be achieved using traditional learning methods such as notes and paper flashcards. This also conforms to findings by Yoke et al. who observe that traditional methods are far much less effective in ESP classes given that they are rarely relevant and are unresponsive to emerging trends [29]. Consequently, the use of AR technology in vocabulary learning is likely to result into higher scores compared to their counterparts who use traditional vocabulary learning approaches [30].

The improved performance among learners can be attributed to positive perception of the use of AR technology in English for Specific Purposes class. According to Sydorenko et al. AR technology increases students' learning motivation given that it has the ability to reduce distractions, to block out visual and auditory distractions that might exist within the classroom and to enable the learners connect with the study materials [31]. According to Chang et al. the features of AR technology have continuously motivated learners [1]. The authors opine that motivation levels among learners usually improve when they can relate with the teaching model. As such, a teaching model that incorporates new knowledge using real-life experiences is likely to motivate students. Similarly, prompt feedback is an essential component in ESP classes given that learners are empowered to learn more within a shorter period of time [32]. When these prompt feedbacks are compounded with remote learning, the learners are further motivated [33]. This enhances learning outcomes. Similar outcomes have also been reported by Huang et al who observes that augmented reality technology motivates students because they are able to immerse themselves in their studies and make connections with the real world. Similar studies have also indicated that AR technology increases learners' motivation given that they can use it within both formal and informal settings. Additionally, the students have an opportunity to interact with each other [33] [34].

The third research question was to assess the significance between teachings with traditional teaching and teaching using augmented reality (AR) technology. From the results, there is a significant difference between teaching vocabulary in ESP classes using traditional teaching and teaching with augmented reality (AR). These results also echo the findings by Juan et al. who argues that students' learning capabilities are enhanced when they use AR technology in their classes

[35] [36]. The researcher further elaborates that AR technology uses virtual reality which learners can easily relate to resulting into more comprehensive learning. Pérez-López & Contero, augments also conforms to these findings when it concludes that the technological tools used in augmented reality vocabulary learning results into more creative learning environment and helps in overcoming rote learning [37]. Similar sentiments have also been reported in previous studies [38]. The authors further argue that compared to augmented reality technology learning, traditional technologies such as 2D flashcards are less productive and less enjoyable [39] [40] [41]. From the study, this also explains the fourth research objective which was to assess the impact of using augmented reality technology in the ESP classroom in terms of vocabulary learning and retention. From the results, learners appreciated the importance of augmented reality in vocabulary learning [42]. It also showed how important it is to start thinking about improving the English language teaching methods in higher education by moving away from, or at least complementing the existing traditional English teaching practices, by implementing more innovative methods that depends on emerging technologies such as Augmented Reality [43] [44].

VI. CONCLUSION

Based on the findings herein, the research concluded that there is a significant difference in students learning motivation and vocabulary learning with and without the use of AR mobile technology. As far as the vocabulary learning and retention are concerned, the scores were higher when the students learnt using augmented reality technology compared to the traditional learning methods. Additionally, there is a good perception from the use of AR technology in English for specific purposes class. This can be attributed to the learning ease and flexibility that comes with augmented reality technology. Thirdly, there is a statistically significant difference found between teachings with traditional teaching as compared with AR technology language classes. Finally, there is a very big impact in using AR technology in the ESP classroom in terms of vocabulary learning and retention.

The findings of this study suggest that the AR technology could be an asset in the English language classroom owing to its potential in helping language learners learn vocabulary better and retain them for longer period of time. The findings also suggest that this technology is highly welcomed and applauded by language learners with high levels of satisfaction and acceptance of the methodology. While both the scale and sample size of the present study are too small for us to come forward with definitive prescriptive recommendations for incorporating AR technology into the English language classroom, the findings are in line with the findings of plethora of studies that all came to the same conclusion of successful adoption of AR technology in educational settings in general, and in the English language classroom in particular.

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Design and Development of Areca Sheaths Plate Making Machine

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Abstract

This research focuses on the design and development of the "ARECA SHEATHS PLATE MAKING MACHINE." This research backs the 2030 Agenda for Sustainable Development, particularly in terms of environmental protection and adaptations to responsible consumption and production. The machine was created with the primary goal of molding, heating, and cutting areca sheaths into safe, disposable, and compostable leaf plates. It is made up of a molder with an internal heating coil and dies cutter that are both operated by hydraulic system. When assessing the machine's operation and product quality, a variety of parameters were taken into account. The machine's functionality was assessed by 20 trials, with the finding that the machine is 94.16 percent functional. The soaking duration, die temperature, and pressing time are three (3) elements that directly affect the production rate of the leaf plates. The texture, form, dryness, and appearance of the finished product are all factors in determining its quality. The Pearson product-moment correlation was utilized to find a substantial association between the variables studied, such as soaking time, upper and lower die temperatures, and pressing time, all of which had a direct impact on the machine's production rate. Soaking time and pressing time had a positive association, while temperature and pressing time had a negative correlation.

A Proposed Model of Instructors' Teaching Load Distribution Using Goal Programming

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Abstract

Every academic institution periodically prepares a class-course-faculty assignment, termed as university timetabling. This paper addressed one of the stages of the university timetabling problem which is teaching load distribution to faculty members using weighted goal programming model to optimize the instructor-subject-section assignment by simultaneously maximizing subject preferences and minimizing deviations in total number of units and number of courses among the instructors. The proposed model, which contained 400 decision variables and 230 constraints, was tested in a specific department in an HEI wherein the necessary data including instructors' preference ratings, subject offerings, and institutional policies were considered and incorporated in the model. The Large-Scale LP Solver Engine of Analytic Solver obtained the optimal solution in less than a minute. Different combinations of weights for the goals were also considered in the model and their results were compared to the actual load distribution. The results of the proposed model provided instructor-course assignments with higher total preference ratings and lower deviations in number of units and preparations.

Keywords

Faculty Load distribution, Goal programming, Optimization

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ISBN : 978-93-92105-57-9