A STUDY ON THE INFLUENCE OF AUTONOMY WITH USER PARTICIPATION IN MHEALTH MONITORING APPLICATION

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DECLARATION

I hereby declare that the project report entitled

A STUDY ON THE INFLUENCE OF AUTONOMY WITH USER PARTICIPATION IN MHEALTH MONITORING APPLICATION

is written by me and is my own effort and that no part has been plagiarized without citations.

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DEDICATION

Special thanks to my family, project supervisor and friends.

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First of all I would like to express my deepest gratitude to the All Mighty for His help in giving me the patience and the strength to endure all the obstacles during the completion of my study.

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Finally, I also would like to extend my appreciation to my family who has been with me all along. They have given me motivation and moral support as well as given me financial support in order for me to complete my study.

ABSTRACT

This project is about autonomy study towards behaviour of user participation in using mobile health application (mhealth). This project was conducted to achieve a few goals. The first goal is to increase participation by improve the feature of mobile health application. This objective is important to understand the behaviour of the user. It is important in order to implement in the application because application need to create based on what their requirement. The second objective is to identify the best feature to add based on demographic user. In this objective, it explains about how data can manipulate into application form. And the third objective is to evaluate reliability of autonomy features in mobile health application. For this objective, it will show which feature that have high reliability that review from several mhealth application. In this project, we want to see how an individual will react to autonomy through distribution of questionnaire. From the result that received, we came out with analysis of respondent. From the analysis, we know which behaviour was most influence the individual. As the result already gained, we want to come out with project mhealth application. The result of autonomy will be used as guide in implement into application form.

ABSTAK

Projek ini adalah mengenai kajian autonomi tingkah laku pengguna terhadap penyertaan dalam menggunakan aplikasi kesihatan bergerak (eHealth). Projek ini telah dijalankan untuk mencapai beberapa matlamat. Matlamat pertama adalah untuk meningkatkan penyertaan pengguna dengan menambah baik ciri aplikasi kesihatan. Objektif ini adalah penting untuk memahami tingkah laku pengguna. Ia adalah penting untuk melaksanakan dalam keperluan itu kerana aplikasi itu dibuat berdasarkan apa kehendak mereka. Objektif kedua adalah untuk mengenal pasti ciri-ciri yang terbaik berdasarkan demografi pengguna. Dalam objektif ini, ia menerangkan tentang bagaimana boleh memanipulasi data ke dalam bentuk aplikasi. Dan objektif yang ketiga ialah untuk menilai kebolehpercayaan sifat autonomi dalam kehendak mhealth ini. Untuk tujuan ini, ia akan menunjukkan yang mempunyai kebolehpercayaan yang tinggi yang mempunyai kajian yang dari beberapa permohonan mHealth. Dalam projek ini, kita mahu melihat bagaimana individu akan bertindak balas terhadap autonomi melalui pengedaran soal selidik. Dari hasil yang diterima, analisis responden dapat diolah. Daripada analisis ini, kita tahu yang paling mempengaruhi tingkah laku individu. Hasilnya sudah mendapat, kita mahu keluar dengan permohonan projek eHealth. Hasil autonomi akan digunakan sebagai panduan dalam melaksanakan dalam bentuk aplikasi.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Nowadays, technology is not an unfamiliar thing. Technology uses increase as the years come. In very daily life, there are always having the use of the technology such as phone, tablet, computer and many more. People in this era preferred to use the technology to make their life easier rather than doing it manually. For example, people use technology to keep the detail or information about them self into certain medium. One of the medium that can be used is using mobile application. Mobile application is also one of the technologies that currently develop rapidly.

There are so many mobile application that user can get or downloaded whether get it for free or by paying to gained the application that be required. There are many medium for user can surf, such as application store in Android, Google or any other. It is limitless. If someone

wants to have better management with their financial, they can use the application that have feature about managing and control flow in and out of their money. Other example is health application. User who wants to take care about their health, they can find the application about health care. In this application, user can penetrate the information about their health. The application will record the detail.

By this project, it will cover about the health application. There are many applications about health but not all the application does not include user's requirement. Health application out there just ask the user to enter the detail but it not work like how user want it want to be. There are few new feature will add in the end of the project to make the application user friendly.

1.2 Project Problem

The problem for the project was to increase the participation of user to use mobile health application. Application that already established mostly not fulfils desire of user. By doing this project, it will show what feature that user like the most. From the result, the feature that already mapped can be added into the application.

RP	Project Problem
RP1	User not using the application consistently.
RP2	Demographic of respondent can give effect to autonomy.
RP3	Feature that did not attract user to continue to use the application.

Table 1.2.1 Summary of Project Problem

1.3 Project Question

Based on research problem that already stated in Table 1 two research questions has that need to be answered.

RQ	Project Question
RQ1	What is the variable of autonomy can increase the user participation?
RQ2	How user demographic can give an impact towards autonomy variables in mobile health application?
RQ3	What are the features that map to psychological autonomy variable in mhealth monitoring application?

Table 1.3.1 Summary of Project Problem

1.4 Project Objectives

Based on the project problem and project questions that have been formulated in previous section, the objective of this project has been identify and developed.

i) **RO1: To increase participation by improve the feature of mobile health application.**

Before develop the improvement of the application, it is important to understand the behaviour of the user. It is important in order to implement in the application because application need to create based on what their requirement.

ii) **RO2: To identify the best feature to add based on demographic user.**

In this objective, it explains about how data can manipulate into application form.

iii) **RO3: To evaluate reliability of autonomy features in mobile health application.**

For this objective, it will show which feature that have high reliability that review from several mhealth application.

RO	Research Objective
RO1	To analyse the variable of autonomy to increase user participation in mobile health application.
RO2	To analyse the impact of user demographic towards autonomy variables in mobile health application.
RO3	To evaluate reliability of autonomy features in mobile health application.

Table 1.4.1 Summary of Project Objectives

1.5 Project Scope

There are thing that need to identify before conduct the research. Things that should be considered for the scope of the project were location based on demographic and type of respondent.

This project required to collect data to interpret it into an application in the end of the project. Before reach to that point, data collection need to taken place. The place that been chose to do data collection was at fitness centre located around Melaka and few organisation at Kuala Lumpur. Data was collected based state to see how different background of demographic can affect result of data. For example, respondent from Melaka maybe more open to help in provide data because of they have more time. But opposite to respondent from Kuala Lumpur because they always rushing and do not have time to help with the data. That is the example of different background of surrounding.

1.6 Expected Output

Every project needs to have the outcome at the end to know whether the project manage to achieve the objective or not. There are few targets that should be achieved by end of the project.

i) For knowledge purpose.

At the end of the project, the outcome of the result can be new analysis of an autonomy variable in mhealth application.

ii) For community use.

This project can be as a guideline to developer of application to see which feature that suitable for mhealth application.

As at the end, the feature that been analysis can encourage user to use autonomy tools to increase participations.

1.7 Project Contribution

From this research, there are many benefits and this research does contribute in gather information of data about autonomy that related with user. There were few contributions for this project based on autonomy view.

1. Correlation analysis: This analysis was conducted to analyse autonomy variable correlate with campaign performance in usage of mhealth application in monitoring their health. Based on the result, it will show wgich autonomy variable that correlate with user participation in mhealth monitoring application.
2. Content analysis: For this phrase, the final output should give the result of reliability of the mhealth feature. It will show which feature that reliable for mhealth monitoring application.
3. T-test: To analysis demographic factor that acceptable that gives an effect towards autonomy variable.

1.8 Thesis Organization

In this subtopics will summarize briefly about the content of this research that will start by chapter 1 which is introduction until chapter 6 is conclusion.

Chapter	Content
Chapter 1: Introduction	This chapter will discuss on introduction, project background, research problem research question, research objective, scope, project significant and report organization.
Chapter 2: Literature review	This chapter will explain more details of this project, supported with reading materials and conference paper. Previous related projects will also be included such as type of techniques used, best output by using any techniques and information of proposed techniques.
Chapter 3: Methodology	This chapter will explain the method that will be used in this project.
Chapter 4: Quantitative Data Collection and Analysis	This chapter will explain about the result of the data and the explanations.
Chapter 5: Qualitative Data Collection and Analysis	This chapter will explain about the result of the data and the explanations.
Chapter 6: Result and Discussion	In this chapter, it will discuss about the result of the analysis and the discussion of the analysis.
Chapter 7: Project Conclusion	Project summarization, project contribution and project limitation will be explained. All the steps that have been made and that have been developed for this project will be listed briefly. In this last chapter also explain on future work for other researchers.

Table 1.8.1 Table of content based on chapter

1.9 Conclusion

Through this chapter, it explained about the process of indicates the problem statement, objectives and scopes have been stated in this chapter. Literature reviews on the related work will be conducted in the next chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will discuss the literature review of the project. Literature review is a related study that relies to this project. In this chapter, the articles, books and websites will summaries about important information of the research sources of the project. It also provides a hardy guide and a background of the certain topics. This chapter is the most important step which helps justify the choice of the research or project, establishes the importance of the particular topic, provides background information and discovers how the project is related to the works of others.

2.2 Project Introduction

Before continue with the project, we need to know what autonomy study is. Autonomy is a rank of freedom and quality of behaving that allowed to an employee over their task or job. In general, jobs with high degree of autonomy can cause a sense of responsibility and greater task or job satisfaction in someone. Not every individual prefers a task with high degree of responsibility.

2.3 Critical Review of Current Problem and Justification

2.3.1 Self-determination theory (SDT)

a) Understanding SDT

In this chapter, it explained about what theory that used for the project. The theory that discussed was self-determination theory (SDT). There are many resources about self-determination theory that can gain from the internet, library or other knowledge places.

Irivine K (2014) stated that the concept of self-determination theory already created and developed by researchers named Edward L. Deci and Richard M. Ryan. In the article, it says according to Deci and Ryan on 3 different years; 1985, 1991 and 2000, it explains that self-determination theory is a human motivation by focusing on the importance of human internal resources so that development and behaviour can be recorded. In this theory, human are assumed that they are active, internal tendencies towards psychological growth and integration.

Self-determination theory claims that human have three nature psychological that needs to considered as universal necessities. Self-determination theory also claim that there are many different approaches to motivation and differentiates between other different types of motivation.

Source from the website Procrastination explained that self-determination theory emphasis by supporting our natural or intrinsic tendencies to behave in effective and healthy ways. The basic feature of the theory is the internal versus external motivations in act. For example at one end are external forces like paying taxes or obeying speed limits. Another example there is identifying with what someone else suggests or has achieved and wanting to be more like them. They intended to follow the 'role' to achieve the goals.

Therefore, there is acting based on completely internal and freely-chosen codes of conduct. Lots of research has shown that long-term dedication is related to internal motivations. For example, athlete Wayne Gretzky went on to coach and manage hockey teams after he retired: that's internal motivation. It means that he do it with his own willingness without any other force. This theory has been used by researcher all to do researched and practiced by a network of researchers around the world.

b) Part in SDT

i) Intrinsic

Bainbridge (2016) explained that intrinsic motivation actually refers to motivation that born from inside of an individual rather than from other external or outside rewards.

The motivation to complete the task are comes from the satisfaction of that individual itself in doing the task. They feel the enjoyment in order to completing the task that given. Besides that, intrinsically motivated person will try to figure out and work on a solution to a problem because the challenge of finding a solution is provides a sense of pleasure. When they complete their task, they do not ask to be rewarded.

For example, student always want to get a good result for their assignment. But if the assignment does not interest for student, the possibility getting good result may not enough to maintain that motivation of student to put any effort into the project. Student will not have motivation to complete the assignment because to not have interest in doing it. In the end, it will give that student bad result.

Cherry K. (2016) says that intrinsic motivation refers to behaviour that is driven by internal rewards. In other words, the motivations to engage in behaviour come from within the individual because it is intrinsically rewarding. It is very opposite with extrinsic motivation. In extrinsic motivation, it involves by attract in behaviour in order to earn external rewards or avoid punishments.

The author also stated the definition view from several role models. Based on Coon & Mitterer (2010) they say that intrinsic motivation occurs when person intent to act without any external rewards offered. They simply enjoy the activity or see it as an opportunity to explore, learn, and actualize our potentials. From there, they also can improve them self.

Another one is from Brown (2007) that stated intrinsic motivation refers to the reason of person perform certain activities for fulfil their pleasure or satisfaction.

2.3.2 Intrinsic

a) Component in intrinsic.

i) Autonomy.

Autonomy can be used in so many field of research, said by Collier J. (2002). Basically, autonomy means self-governing and comes it from a Greek word meaning independent. Autonomy also defines as definition of thousands of people working on their own, for fun.

ii) Mastery

Mastery can be understood by adding one's own expertise and earning respect within the community. Individual with mastery can reach the successful point with their skill.

In general, mastery probably the oldest definition, tied to the idea that a journeyman, artist or craftsman would produce a art or 'masterpiece' to show that they had moved beyond a need for further support. Not a new definition, although applied in current educational circumstances it broadly translates as 'need to reached a level of unaware competence'.

Mastery does not just know a fact but it is using that fact in increasingly more complex situations to reach something or some

point. For the situation, a student with better mastery will score higher in the exam compared to the student with lower mastery. Even they know the same content; it did not guarantee high score because of mastery level.

To more understand about mastery, mastery basically the skill of someone to gain something and understand fully about it. They can teach and explain to other people about the things that they master. They also have ability to identify and find the solution of the problem.

iii) Purpose

In general, purpose means being part of movement to create a shared body of knowledge for the world. It means that an anticipated outcome that is intended or that guides as planned actions.

2.3.3 Autonomy

a) Definition of autonomy.

According to Irvine K. (2014), it stated that autonomy concerns encourage to be causal agents and to act in harmony with integrated self. He also takes a quote from Deci and Ryan and translates it into his own word. It stated that to be autonomous does not mean to be independent. It means having a sense of free-will in doing something or act out of interests and values.

Basically autonomy can represent people who have fully control over them self. They actually actuate to do the task that given as good as possible. Autonomy person did not take the task as a burden, but they actually really enjoy doing it. They tempted to do the task without forces from anything

because they like to do it. Autonomy person also not expect for the reward. They want to do the task in order to gain more experience and satisfaction for them self.

2.3.4 Relation between autonomy with user participation.

a) Characteristics of autonomy.

i) Self-directed.

From the book Learning (2017), it states that Long & Guglielmoni (2008) self-directed is the most basic, natural response to newness, problems or challenges in our environment and surrounding. Individual can look, feel, listen, turning and tasting happen as the young scientist explores.

Self-directed person can have self control by saying that their world in such way that the opportunities of the future goals becoming important determinants of his action than the events of the past. They intend to participate to see how far they can reach for something. For example, FTMK is looking student to volunteer for a program. The student who participate is self-directed because they willing to volunteer them self without any force or invitation by their surroundings.

ii) Perceived choice.

Perceived choice is to notice or become aware of (something) or to think of (someone or something) as being something stated.

iii) Goal setting

Goal setting is a mental action technique that used to increase individual's commitment towards achieving a personal goal that introduced by Mac, B. By having a short or long term goal can encourage the individual to work harder and more focused on the task.

Goal setting is about distinguishing what to accomplish as well as how it can be accomplish (process goals) and measure that accomplishment (performance goals). While testing objectives are separated into reasonable strides and afterward systemically accomplished inspiration, duty and self-assurance will develop.

Goal setting must be set by age, phase of improvement, certainty, capacity and inspiration of the person. Apprentices require fleeting effortlessly accomplished objectives to support their self-assurance though the accomplished individual needs additionally difficult yet sensible objectives.

Giving the example, there are examination will held in a month and all the student need to take the examination. Student must set the goal in order to reach their target.

iv) Responsibility

Generally, responsibility is duty or obligation to satisfactorily perform or complete a task that assigned. Individual that doing the task must fulfil and will have a consequent penalty for failure. A responsibility is something that required individual to do as an upstanding member of a community.

2.3.5 Autonomy in participation in mobile application

a) Mobile learning

Mobile learning is an effective learning takes place when the learners' satisfaction level is high. Based on this article, it revealed that learners can more understand when they use smart phones for their learning purpose. The process of learning gets easier when the learners get quick access to additional resources while they are learning in the class. For example, finding definitions of the unknown words, examples and further explanations will help them to understand better.

In fact, Ramamuruthy & Rao (2015) accessing information through smart phones encourages meaningful communication between teacher and learners. Besides that, it can help enables them to produce creative and high quality work. It can say that smart phones usage will make individual more critical thinking, creative thinking and communication and collaboration skills for learner. Although learners have moved toward autonomous learning, they are still reliant on the teachers to achieve their goals.

According Smith (2013), mobile applications may be effective tools to improve communication and navigation skills in students with intellectual disabilities (ID) within postsecondary education (PSE) settings. In order to understand these results, it is necessary to evaluate these interventions with other groups of students. Assorted gatherings of different ages and capacity levels ought to be implemented in future research. Future research should consider the development of social and language skills for students using these mobile applications.

Based on Gowin-Jones (2011), he stated that students, mobile devices can be integrated in real-life interests and academic roles. If learner autonomy is about personal choice, then mobile should work as an ideal enabler. An example of personal choice in action is how individual choice can work in a different situation with particular problem, such as failure, in their previous lifetime.

b) Mobile game

In mobile game, the user or participants will expose to leisure contexts, they expected to choose whether what to play, when to play, how long to play and when to stop and potential restart playing again. According to Deterding (2016), participants would start to play when they want to play it. It is called self-directed. The article says that the feeling "I want to play on the computer now, and nothing speaks against that, because I don't want to do anything else as well, then I do that, and then I start that." In turn, participants would play until they do not want to play anymore and stop when they lost interest.

c) Mobile health

Mobile application basically is about managing the health care of the user. In this project, it will focus on mobile health application. Health application includes the calculation and estimation of daily calories should be taken, how user involves them self in the application and many more.

Merriam, Caffarella & Baumgartner (2012) stated that one area of self-directed learning for personal use that has been better documented than others is the need to assemble and assess data and settle on fundamental and groundbreaking choices on medicinal services issues. A conclusion of an existence undermining condition frequently triggers escalated self-coordinated learning for the individual and for dear loved ones that relates her own involvement with self-coordinated learning after finding of a serious illness.

The next article explained that treatments for critical illnesses are constantly changing as medications and treatment regimens are developed by Long & Guglielmino (2008) in book Learning. It stated that Holland (1992) reports on the self-directed learning efforts of individuals dealing with the unpredictable disease progress and multiple treatment regimens for multiple sclerosis.

2.4 Taxonomy of Autonomy

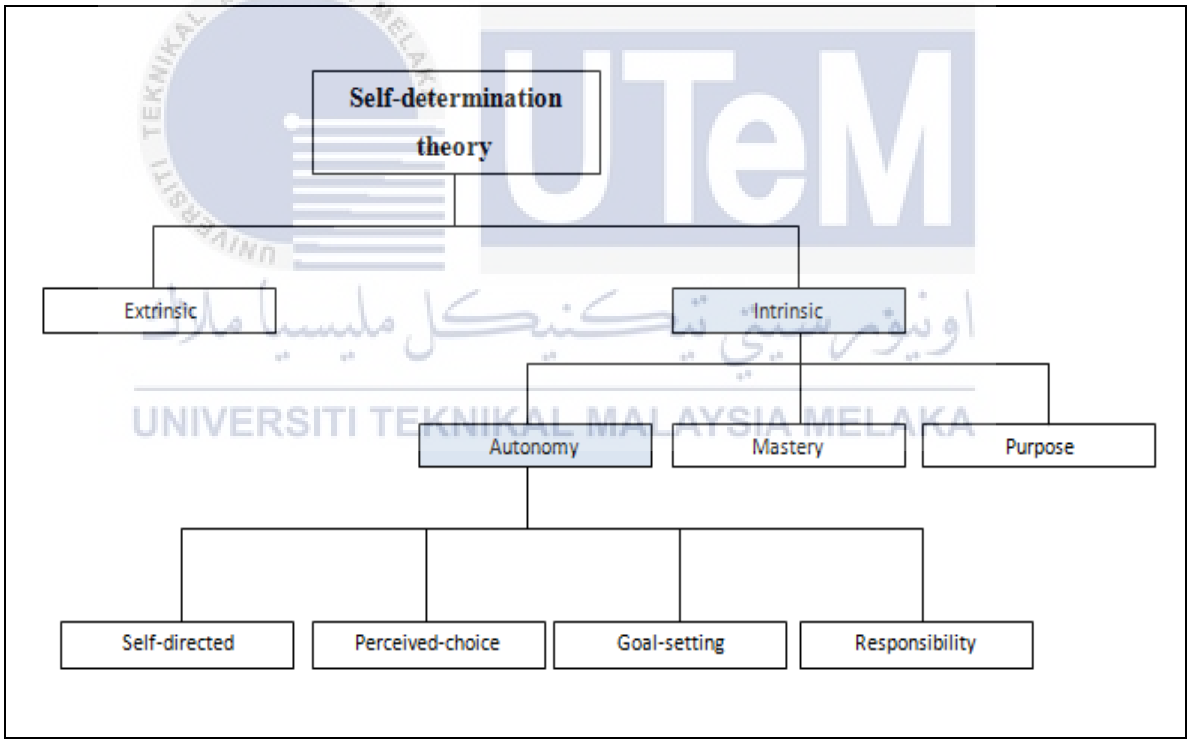


Figure 2.4.1 Taxonomy of Autonomy Study

2.5 Mapping for autonomy studies

Author	Area	Self-directed	Perceived choice	Goal setting	Responsibility
Viji Ramamuruthy, Srinivasa Rao	Mobile learning application		√	√	
Catherine Caudle Smith (2013)	Mobile learning application for disable people			√	√
Robert Godwin-Jones (2011)	Mobile learning application for student		√	√	√
Sebastian Deterding (2016)	Game application	√		√	√
Sharan B. Merriam, Rosemary S. Caffarella, Lisa M. Baumgartner (2012)	Health application on diagnosis	√			
Huey B Long,, Lucy Madsen Guglielmino (2012)	Health application	√	√	√	

Table 2.4.2 Mapping from Autonomy Studies

2.6 Proposed Solution

Based on the article above, there are a few things that can be concluded to make it the proposed solution. The result from mapping in this chapter will show how people which autonomy that most of people more preferred. The high autonomy will be choosing to elaborate and turn it into application form.

The application that already added with the chosen features will be used by 10 random people that volunteer to try the application. From there, the respond will be taken. The application will be upgraded based on the respond as the guideline.

2.7 Conclusion

In conclusion, this chapter is explained in detailed about the project by references the sources such as journal, article and other source that are related to the project. This project chapter is crucial and important because it covered both literature review and project methodology. Literature review gives an overview about the whole project as what is the project all about. There are many references that have made by researches that can be used in implementation. From the research, reference and case study that already gain, it can help to develop the project.

The methodology on the other word shows the steps and process involved in developing the whole project from the beginning until it is complete. There are many steps and technique must be followed as to ensure the success and deliverable of the project. The project methodology will help in designing the project by following each phrase. The next chapter will analyze all the problems exist that need to improve or upgrade.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In methodology chapter, it explained about the methods intend that would be used to collect data. Methodology is a system of principles or rules from specific methods or procedures that may be derived to interpret or solve different problems within the scope of a particular discipline. It is often necessary to include a consideration of the concepts and theories which underlie the methods.

When describe the methods, it is necessary to state how the questions were addressed. The methods should be described in enough detail for the study to be performed or at least repeated in a similar way in another situation. Every stage should be explained and justified with clear reasons for the choice of your particular methods and materials.

In this chapter, it covered on how to describe and what to implement in the project. In addition, project milestones also can be the guideline to complete the task in stage by stage of the activities and duration that suggest within the time that provided.

3.2 Methodology

The methodology for this project that will be used is mix method using explanatory design. Mixed methods is a research approach which researchers collect, analyze, and integrate both quantitative and qualitative data in a single study or in a sustained long-term program of inquiry to address their research questions.

It is also an approach for researcher between qualitative and quantitative inquiry. Depending on choices made across four dimensions, mixed-methods can provide an investigator with many design choices which involve a range of sequential and concurrent strategies. Defining features of these designs are reported along with quality control methods, and ethical concerns. Useful resources and exemplary study references are shared. Mixed methods research takes advantage of using multiple ways to explore a research problem.

There are two major of research paradigm in mix-method; quantitative research and qualitative research. Quantitative research (i.e., a positivist paradigm) has historically been the cornerstone of social-science research. For this type of research, researchers need to eliminate biases, remain emotionally in particular (separate) and uninvolved with the objects of study and test or empirically justify the stated hypotheses.

Qualitative support a constructivist or interpretive paradigm and faced multiple-constructed realities in large amount, that time and context free generalizations are neither desirable nor possible. The research need to know that it is impossible to differentiate fully causes and effects, that logic flows from specific to general and that knower and known cannot be separated because the subjective knower is the only source of reality.

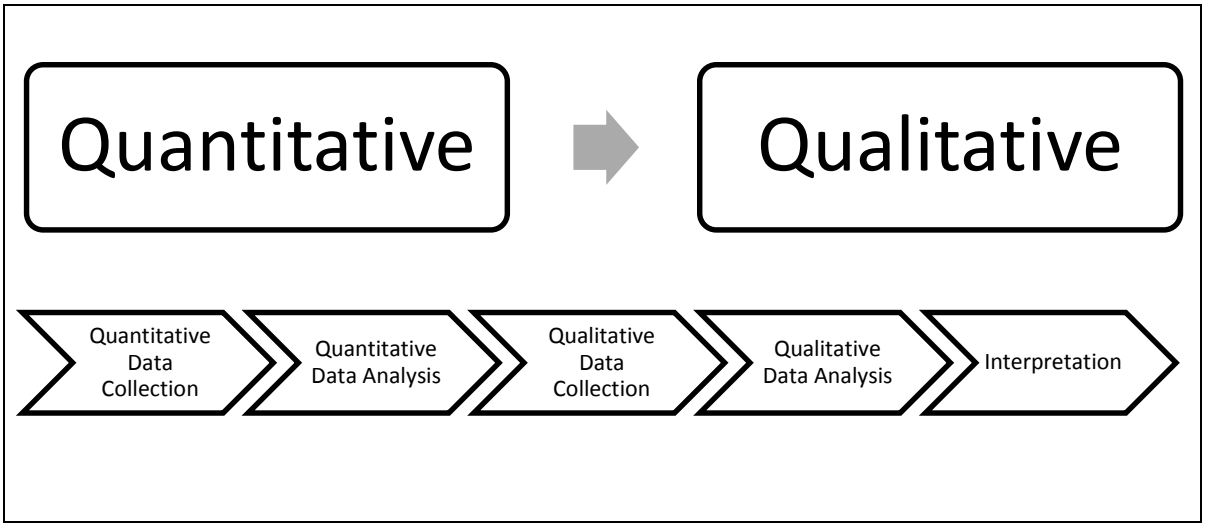


Figure 3.2.1 Sequential Explanatory Strategy

The collection and analysis of quantitative data is followed by the collection and analysis of qualitative data. Equal priority is given to the two phases. Data are integrated during interpretation. Primary focus is to explain quantitative results by exploring certain results in more detail or helping explain unexpected results. For example, follow-up interviews can be use for better understand the results of a quantitative study.

1) Quantitative Data Collection

This is the first phrase before data were collected. 250 questionnaires were distributed but only 126 were given the feedback. From 126 surveys that returned, the data were key-in into excel and IBM SPSS Statistics 22 to interpreted the data.

2) Quantitative Data Analysis

Data that received will be analysing. The data that already received will be analysis using statistical test. Demographic of the respondent were analyse. The percentages were then recorded. Before start analysis, the hypothesis needs to be identified first. The hypothesis that want to show here were how demographic can affect the autonomy and what is the rekated with user participation. Table below shows the draw of the idea of hypothesis.

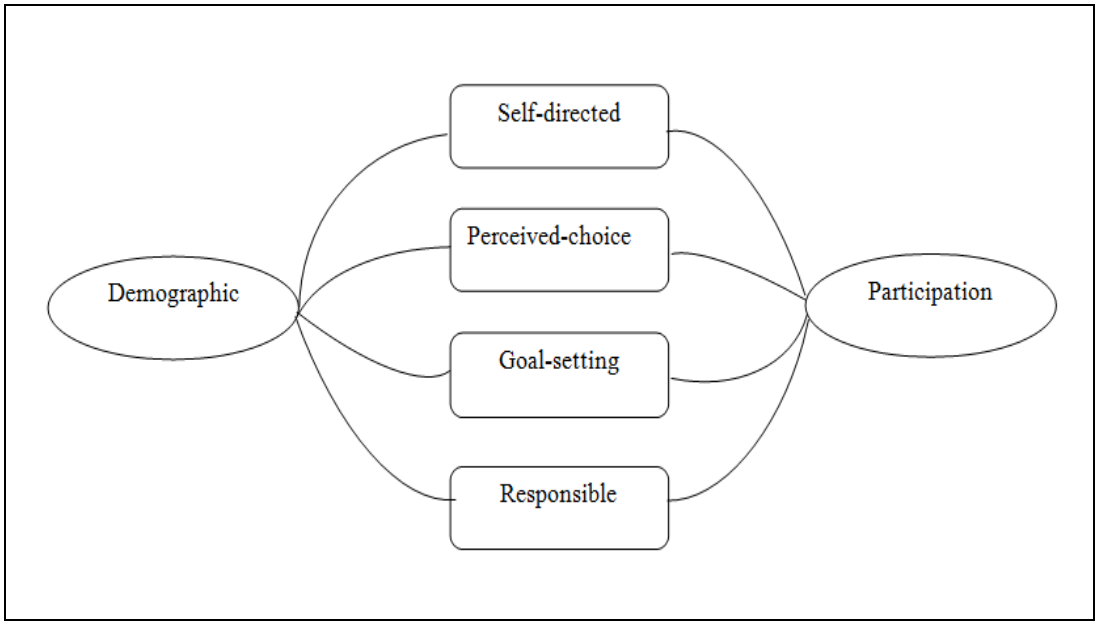


Figure 3.2.2 Draw of Relation between Demographic and Autonomy and related to User Participation

3) Qualitative Data Collection

In this phrase, the design qualitative study can be concluded based on what learn from quantitative results. The result then can be concluded using correlation analysis.

4) Qualitative Data Analysis

10 random users will be chosen to answer the survey based on result data that earn. User then will try to use the application and give feedback about that application. User also will be interview and will be asked whether if they want to use the application or not.

5) Interpretation

Based on survey from user, the final result and feedback will be interpreted into an application form.

3.3 Project Schedule and Milestones

In this chapter shows duration of the task involve in this project. Each of tasks has starting and completion time to make sure every task is done on time. The milestone functions as a guide and shown in Gantt chart.

No	Task	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Prepare proposal												
2	Improvement proposal												
3	Chapter 1 Introduction												
4	Chapter 2 Literature Review												
5	Chapter 3 Methodology												
6	Chapter 4 Analysis And Design												
7	PSM Report												
8	Final Presentation												
9	Correction draft report based on supervisor's comments.												

Table 3.3.1 Project Schedule

No.	Activity	Week	Responsibility
1.	Submission proposal	Week 1	Student and Supervisor
2.	Proposal Correction/improvement Chapter 1/List of supervisor/title	Week 2	Student, AJK PSM and Supervisor
3.	Start Chapter 1 Introduction	Week 3	Student and Supervisor
4.	Chapter 1 &Start Chapter 2 Literature Review	Week 4	Student

5.	Start Chapter 2 to find the previous research paper for the literature review	Week 5	Student
6.	Submit Chapter 2 and start Chapter 3 Methodology	Week 6	Student and Supervisor
7.	Chapter 3 and start Chapter 4 Implementation	Week 7	Student and Supervisor
8.	Chapter 3 and start Chapter 4 Implementation	Week 9	Student and Supervisor
9.	Chapter 3 and start Chapter 4 Implementation	Week 10	Student and Supervisor
10.	Project Demo & PSM Report	Week 11	Student and Supervisor
11.	FINAL PRESENTATION (PA)	Week 12	Student, Supervisor and Evaluator

Table 3.3.2 Milestone

3.4 Conclusion

In conclusion, this chapter has discussed the process that involved in this project to. The methodology is useful to make the whole project work well. To ensure the project is start and end within the time that has been planned in the milestones is one of the purposes in this chapter. The next chapter would discuss about data collection process.

CHAPTER 4

QUANTITATIVE DATA COLLECTION AND ANALYSIS

4.1 Introduction

Data collection is phrase to gathering and measuring information from variety of sources to get a complete and accurate picture of an area of interest. Data collection let a person or organization to answer relevant questions, evaluate outcomes and come out with assumption or prediction about future probabilities. The data collection component of research is common to all fields of study including physical and social sciences, humanities, business and many more. For this research, the field that focused on were the relation of demographic (age, gender, race, occupation) with autonomy of a person.

Data analysis is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. It is the process of developing answers to questions through the examination and interpretation of data. Analysis phrase is steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion. There are a variety of specific data analysis method, some of which include

data mining, text analytics, business intelligence, and data visualizations. From data analysis, it will help to understanding results from surveys, pilot studies (for providing information on data gaps) and formulate the quality of objectives.

4.2 Establishing Questionnaire Reliability

4.2.1 Pilot study

Pilot study are frequently carried out before large-scale of quantitative research because to avoid time and money being wasted on an unwanted designed project. A pilot study is usually carried out on the relevant population, but not for form part of the final sample. This is because it may influence the later behaviour of research subjects if they have already been involved in the research.

For factor analysis to run there must at least be [*X variable (items)* x 5] respondents. Hence, 70 respondents as pilot are chosen as in this case the maximum number of items for each variable is 10. 53 out of 70 respondents were students and the rest of respondent were in working sector.

The purpose of a pilot study is to see the usefulness of question given whether it is acceptable to present more than summary statistics of the data. It is also to identify whether the questions are understood by all classes of target respondents and if any questions that should be rephrased, added or deleted.

The software that used to calculate the Cronbach Alpha is IBM SPSS 22. This software can calculate the value for each variable and set of items in that variable. Pilot study is conducted for duration 2 weeks.

4.2.2 Item Analysis

Variable Name	Cronbach's Alpha Value
SD1	0.749
PC1	0.742
GS1	0.745
R1	0.745
SD2	0.835
PC2	0.746
GS3	0.741
R4	0.749
SD3	0.745
PC3	0.796
GS3	0.756
R3	0.770
SD4	0.748
PC4	0.754
GS4	0.821
R4	0.794

Table 4.2.2.1 Cronbach's Alpha after pilot test

After pilot study was carried out, the result of Cronbach's Alpha was shown as table above. The threshold that is set for Cronbach's Alpha is 0.7 which means that the value should be 0.7 and above. If there any variable with value less than 0.7 will be deleted. All the Cronbach's Alpha value of the variables is 0.7 and above which shows that the Cronbach's Alpha test done on the variables meets the threshold.

4.3 Data Collection

For data collection, it is carried out by distributing the questionnaire to several places. There are 250 copy of questionnaire that needs to distribute. The questionnaires were

distributed using 2 ways; delivering the set of questionnaire to respondents directly and distributed it through online using Google form document.

The questionnaire was provided by supervisor. The questionnaires were distributed at all around Melaka. Respondent in Melaka was focused on fitness centre and sport centre; such as futsal court and badminton court. The respondents were focused on people that have different background based on their basic demographic, such as; age, gender, race and occupation. The questions were asked about health condition and how the respondent will answer the question based on their thinking.

The process of collecting data questionnaire was conducted in 2 weeks. From 250 questionnaires, only 125 give the feedback.

4.4 Data Screening

After data were collected and gathered, the items for will analyze for any missing data. For this case, data screening will be used. Data screening can ensure data is clean and ready to go before conduct further statistical analyses so that data can be used and valid.

For data missing, the method that used was deletion method. This method consists of listwise deletion and pairwise deletion. Listwise is the simplest method to use as it deletes completely the data which has missing value but this reduces the number of data.

Pairwise deletion does not entirely delete the data but keeps as many cases possible for analysis which makes the sample different every single time. From all the methods discussed, the best method to handle missing data for this present study is narrowed down to listwise deletion and mean substitution.

Based on the missing values analysis, mean substitution is chosen as a better method. Mean substitution is when the overall sample mean of the item is substituted for every one of the missing data in that item. The theory of mean substitution is that, if there is lack of any other information, the mean is the best single estimate.

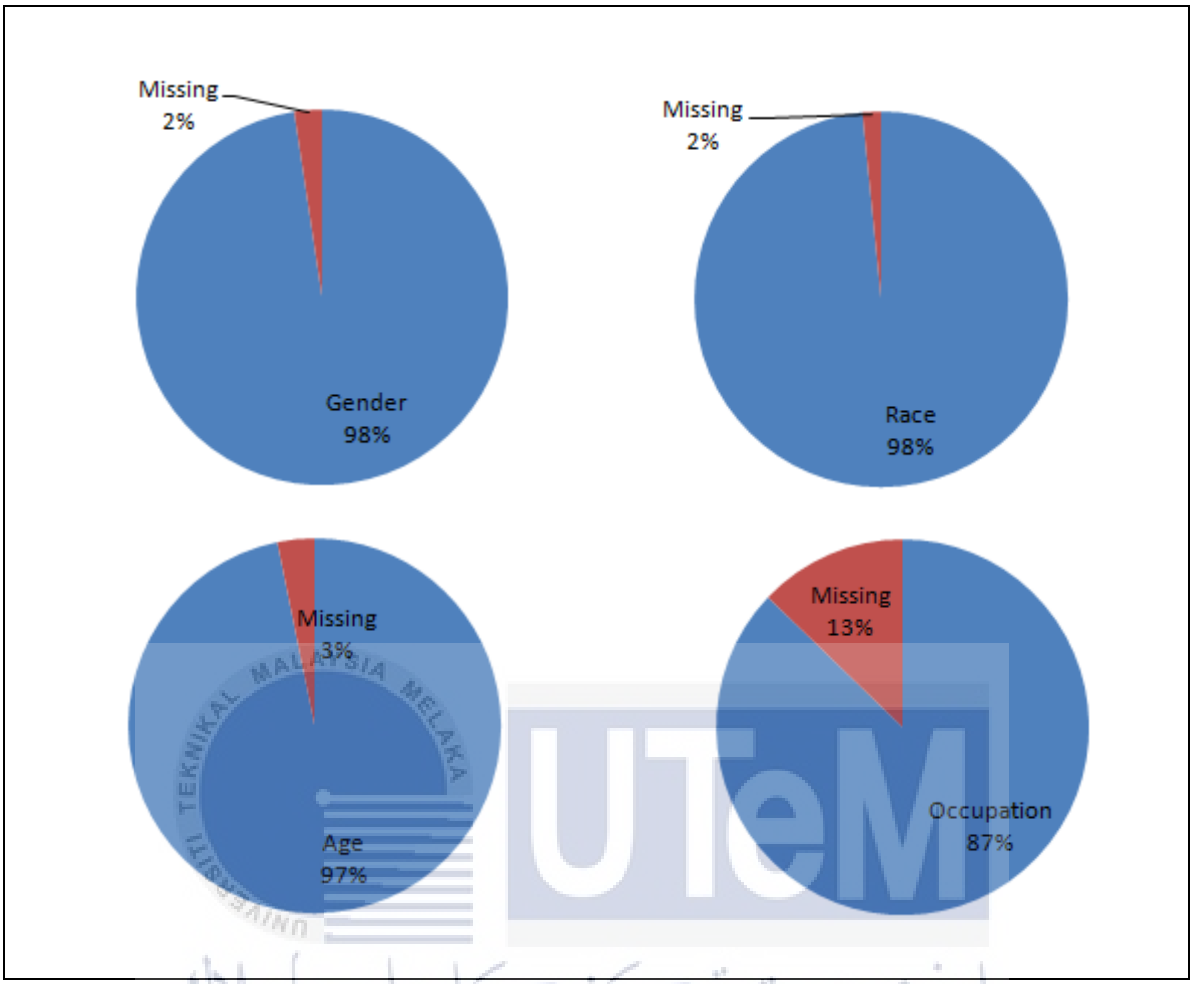


Figure 4.4.1 Summary of Missing Data

4.5 Statical Analysis

4.5.1 Respondent Profile

For respondent profile, it will explain about the demographic of the respondent. There are 125 respondents that involved throughout this survey.

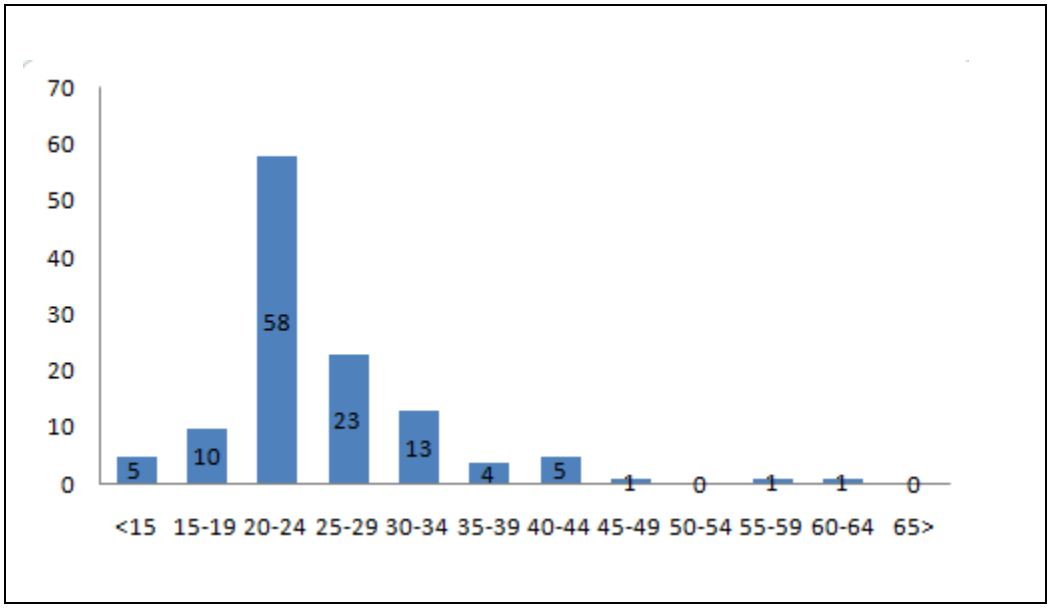
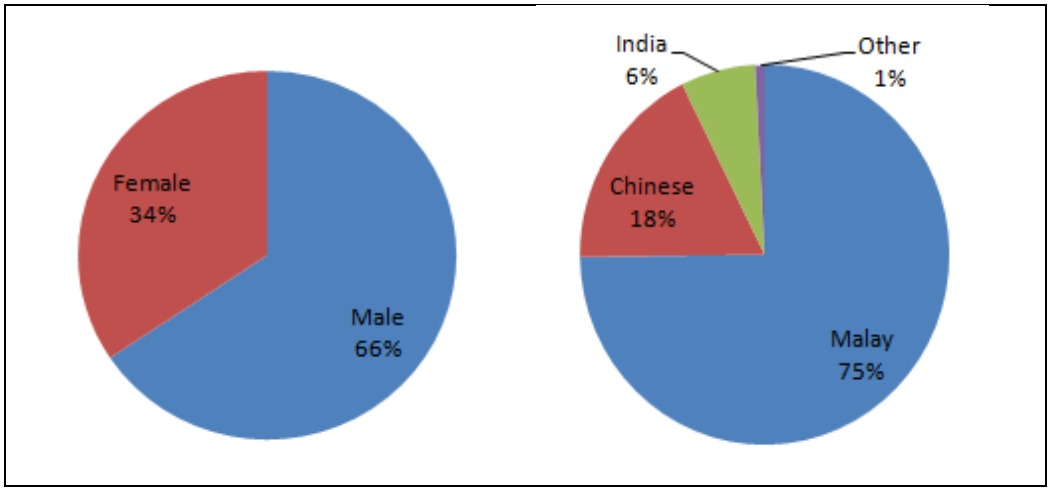


Figure 4.5.1.1 Summary of respondent involved in survey

The table show the percentage of respondent that involved all along in this survey in 2 weeks. It includes participation from the youngster followed by the adults and also the seniors. The graph were analyse after data completely collected and turn it into graph form. It is as a guide in calculating the data collection purpose.

Besides that, the demographic also focused on race. The respondent that involved in this survey was Malay, Chinese, India and others. Gender aspect also included in this survey. Other demographic that was focused on was occupation.



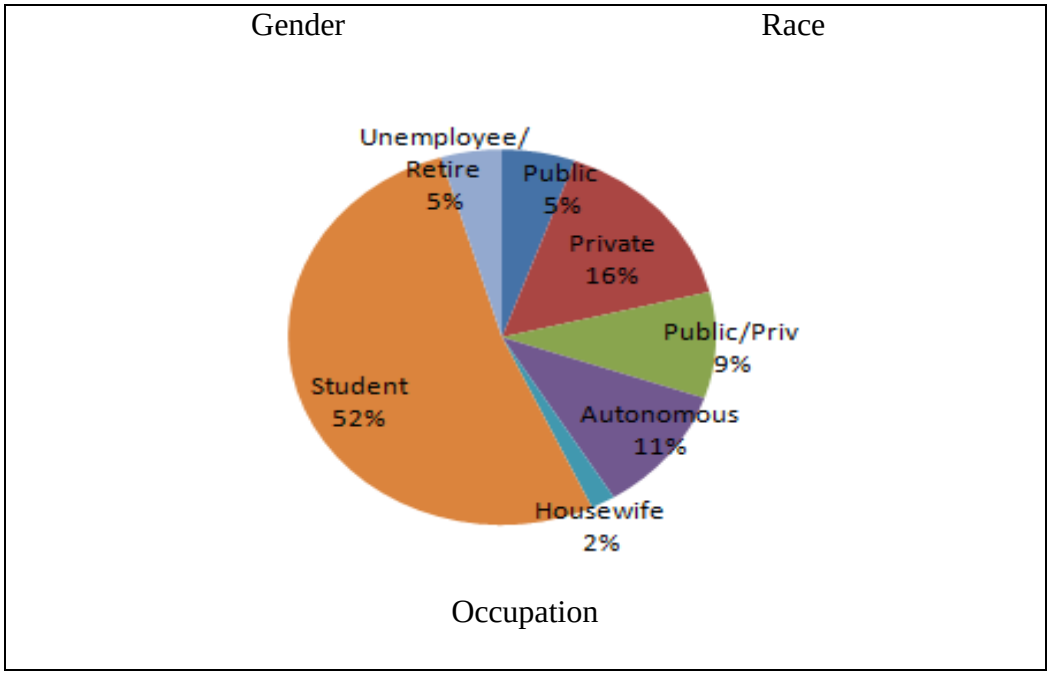


Figure 4.5.1.2 Summary of Respondent Demographic

4.5.2 Descriptive Analysis

The table shows the descriptive analysis for demographic survey.

Age		selfdirected	perceivedchoice	responsible	Goalsetting
1.0	Mean	3.0000	5.0000	4.0000	3.6000
	N	1	5	5	5
	Std. Deviation	.	.00000	.00000	.54772
2.0	Mean	2.8571	3.6000	3.7000	3.2000
	N	7	10	10	10
	Std. Deviation	.69007	1.34990	1.25167	1.39841
3.0	Mean	2.8780	3.3276	3.6207	3.0862
	N	41	58	58	58
	Std. Deviation	.74817	1.12994	.89497	.73232
3.7	Mean	3.5000	3.5000	3.7500	3.7500
	N	2	4	4	4
	Std. Deviation	.70711	1.73205	.95743	.50000

4.0	Mean	3.2353	3.4348	3.8261	3.2609
	N	17	23	23	23
	Std. Deviation	.56230	.94514	.98406	.86431
5.0	Mean	3.2500	3.5385	4.0000	3.3077
	N	12	13	13	13

Table 1 Descriptive Analysis for Age

SMEAN(gender)		selfdirected	perceivedchoice	responsible	Goalsetting
1.0	Mean	3.0000	3.5250	3.7000	3.1750
	N	61	80	80	80
	Std. Deviation	.73030	1.19042	.90568	.89690
1.3	Mean	3.5000	4.0000	4.0000	3.3333
	N	2	3	3	3
	Std. Deviation	.70711	1.00000	1.00000	.57735
2.0	Mean	3.1429	3.5238	3.8571	3.3333
	N	28	42	42	42
	Std. Deviation	.65060	.99359	.89909	.78606
Total	Mean	3.0549	3.5360	3.7600	3.2320
	N	91	125	125	125
	Std. Deviation	.70495	1.11835	.90161	.85323
	N	0	0	0	1
	Std. Deviation	.	.	.	.
Total	Mean	3.0549	3.5360	3.7600	3.2320
	N	91	125	125	125
	Std. Deviation	.70495	1.11835	.90161	.85323

Table 2 Descriptive Analysis for Gender

SMEAN(occupation)		selfdirected	perceivedchoice	responsible	Goalsetting
1.0	Mean	3.4000	3.1667	3.6667	3.6667
	N	5	6	6	6
	Std. Deviation	.54772	.40825	.51640	.81650
2.0	Mean	2.8333	3.1176	3.5882	3.0588
	N	12	17	17	17
	Std. Deviation	1.19342	1.21873	.93934	.89935
3.0	Mean	3.1250	3.2000	3.7000	3.2000
	N	8	10	10	10
	Std. Deviation	.35355	.91894	1.15950	.78881
4.0	Mean	3.0000	3.4167	4.1667	2.9167
	N	10	12	12	12
	Std. Deviation	.94281	1.16450	.93744	.99620
4.7	Mean	3.2000	4.5000	4.2500	3.5625
	N	15	16	16	16

	Std. Deviation	.41404	.63246	.57735	.51235
6.0	Mean	2.9737	3.5254	3.6271	3.2373
	N	38	59	59	59
	Std. Deviation	.59215	1.11967	.84890	.85780
7.0	Mean	3.6667	3.4000	3.6000	3.0000
	N	3	5	5	5
	Std. Deviation	.57735	1.51658	1.51658	1.22474
Total	Mean	3.0549	3.5360	3.7600	3.2320
	N	91	125	125	125
	Std. Deviation	.70495	1.11835	.90161	.85323

Table 3 Descriptive Analysis for Occupation

SMEAN(race)		selfdirected	perceivedchoice	responsible	Goalsetting
1.0	Mean	3.0484	3.4457	3.7065	3.1848
	N	62	92	92	92
	Std. Deviation	.68777	1.11300	.89612	.88863
1.3	Mean	4.0000	4.5000	4.0000	3.5000
	N	1	2	2	2
	Std. Deviation	.	.70711	1.41421	.70711
2.0	Mean	3.0476	3.7727	3.9545	3.5000
	N	21	22	22	22
	Std. Deviation	.80475	1.15189	.95005	.74001
3.0	Mean	3.0000	3.6250	4.0000	3.0000
	N	6	8	8	8
	Std. Deviation	.63246	1.18773	.53452	.75593
4.0	Mean	3.0000	4.0000	2.0000	3.0000
	N	1	1	1	1
	Std. Deviation	.	.	.	.
Total	Mean	3.0549	3.5360	3.7600	3.2320
	N	91	125	125	125
	Std. Deviation	.70495	1.11835	.90161	.85323

Table 4 Descriptive Analysis for Race

4.5.3 T-test

For t-test, Kruskal-Wallis test will be used. The Kruskal-Wallis H test is a rank-based nonparametric test that can be used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. It is considered the nonparametric alternative to allow the comparison of more than two independent groups. For this section, the hypothesis how demographic of user can relate to autonomy.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (race).	Independent-Samples Kruskal-Wallis Test	.570	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(race).	Independent-Samples Kruskal-Wallis Test	.363	Retain the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (race).	Independent-Samples Kruskal-Wallis Test	.256	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (race).	Independent-Samples Kruskal-Wallis Test	.436	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 4.5.3.1 Relation Race to Autonomy

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (gender).	Independent-Samples Kruskal-Wallis Test	.423	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(gender).	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (gender).	Independent-Samples Kruskal-Wallis Test	.659	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (gender).	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 4.5.3.2 Relation Gender to Autonomy

Based on result above, there were showing that both gender and race variable were retain the null hypothesis. It means that they have high significant.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.421	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(occupation).	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.088	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.407	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 4.5.3.3 Relation Occupation to Autonomy

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.170	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(age).	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.168	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure 4.5.3.4 Relation Age to Autonomy

Based on Figure 8 and Figure 9 above, there were showing that gender and race have the same hypothesis. It means that gender and race have not affected anything towards the autonomy of user participation. It is because someone's gender and race were not a benchmark or a problem for someone that intended to take care of their health.

Meanwhile, the result of age and occupation hypothesis shows that these two variables can give effect for someone if they want to take care of their health. The variable that will take count for analysed was the perceived choice.

4.5.4 Correlation analysis

Correlation analysis was conducted to see whether autonomy mechanism correlate with the user participation.

		Campaign Performance
Self-directed	Correlation Coefficient	.344**
	Sig. (2-tailed)	.001
	N	91
Perceived-choice	Correlation Coefficient	.407**
	Sig. (2-tailed)	.000
	N	125
Responsible	Correlation Coefficient	.317**
	Sig. (2-tailed)	.000
	N	125
Goal-setting	Correlation Coefficient	.223*
	Sig. (2-tailed)	.012
	N	125

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.5.4.1 Correlation Analysis

Diagram shows the result of correlation analysis. It shows all the autonomy mechanism were significant to user participations except goal setting. It is because goal setting feature can change and user may have different aim and goal for them self from time to time.

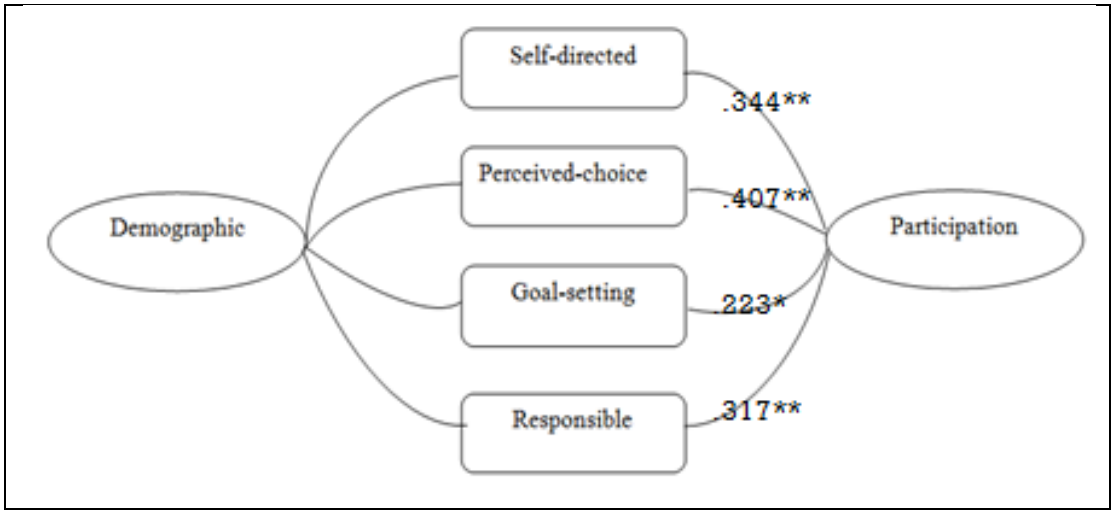


Figure 4.5.4.2 Illustrate of Correlation Result

4.6 Conclusion

This chapter consists of the design of the research instrument tool which was the questionnaire. The research instruments are then validated through content validation and construct validation. Pilot study is carried out and item analysis has been carried out in this chapter and the results have been analyzed. In the next chapter, the data will be collected with the main sample size and the collected data will be analyzed.

CHAPTER 5

QUALITATIVE DATA COLLECTION AND ANALYSIS

5.1 Introduction

For this chapter, it wills briefly a little method and the result for purpose to achieve the third objective of the research which was developing the autonomy features into mobile health application form. There will be variable of features that reflect the autonomy in the application. Autonomy in application means, user can have full control of them self towards the application.

5.2 Self-Determination Theory

Autonomy refers to individuals' desires to regulate behaviour based on their own values and interests. In order for mhealth app to encourage autonomous motivation, it must accurately portray the value of the associated behaviour change, give users a choice in their interaction with the app, acknowledge users' perspectives,

and provide an action plan to support individuals and their needs. This has the potential to fundamentally change how patients manage their own health.

Growing evidence suggests that health care is more efficient and effective when patients are actively engaged in their treatment. Engaged, or activated, patients collaborate with their providers, are treated with respect and dignity, receive information related to their care, and are involved in decision-making. Successful care management programs targeting patients with high needs and high costs and are associated with improved quality of life, functional autonomy, and decreased hospital use.

Mobile health applications, or apps, designed for smart phones can help empower high-need high-cost patients to self-manage their health. In this issue brief, it is describe criteria for evaluating mobile apps for high-need, high-cost populations based on their potential to improve patient engagement and on their quality and safety.

For Ashley Davis, using her smart phone as an ICU nurse provides quick and easy access not only to medical information, but also to a critical care physician. Mobile health apps will give patients more autonomy and control of their own health and care, and better connect patients with providers as a way to facilitate communication between patients and providers.

Communication through e-mail, phone, or text message communications with patients and their families' health information must be protected. For example, after day-surgery, health care providers can send a patient's family text messages about the status of their family member, whether they are in a waiting room or at home unsure about what's happening. Appointment reminders can also be sent to alert patients about appointment times or instructions. While mobile health apps enable individuals to learn more about their own health, some of the resources they seek can be misleading.

The application is also popular with some homebound individuals, O'Connor says. The elderly especially like the app as it also opens up a whole new world to

them. “It’s popular among people who may be alone or who don’t have family in the area. It gives them that interaction with somebody, so that’s a huge benefit,” in addition to the medical implications.

5.3 Method

Out of 300 applications that related to mobile health (mhealth) application were downloaded from iTunes @ App Store and Google Play. 100 final applications were finalized then selected to be analyzed to get the data. The applications were analyzed based on scheme that already drafted based on the autonomy and the variable descriptions of feature were listed. Two different coders who receive the same training and textual guidance (variable) will assign the same value to the same content. According to Krippendorff, in content analysis, reproducibility is arguably the most important interpretation of reliability.

If intercoder do not measure the agreement the reliability of data cannot be conclude whether the result of data from its analysis are accurate or misleading. On a more practical level, if your data does not include accepted levels of agreement according to measures, no journal will publish your data. Your data will be reliable only to people who are ignorant, a pretty low standard for research. The coders divided up the mhealth application that already been downloaded and coded them independently.

To download the mhealth application, the key word of ‘weightloss’ or ‘weight loss’ have been used. It was because the application that will downloaded have mhealth feature to be analysis. After several applications were downloaded, the sample needs to be drawn.

Variable that have been focused on for this project is autonomy. Autonomy in mhealth defined as an application that will help the user to achieve their target and in the same time, user has full control over their health by using the mobile health application. To coding the applications, few general characteristics of mhealth apps need to be identify first;

1. The platform that been choose to download the mhealth application were iTunes @ App Store for Apple and Google Play for Android.
2. The price type also need to be coded whether it is paid or a free application.
3. Developer type such as individual or developer group, non-profit organisation and company also been included into the variable.
4. Content type such as information oriented, function oriented, information and function balanced also been coded.
5. Individuals rating.
6. Apps rating.

M-Health can be defined as mobile computing, medical sensor, and communications technologies for health-care. For this project, there were few information need to focused on before proceed to data analysis.

Market type	Android	193
	Apple	91
Price type	Paid	29
	Free	253
Developer type	Individual or developer group,	180
	Non-profit organisation	69
	Company	32
Content type	Information oriented	158
	Function oriented	73
	Information and function balanced	50

Table 5.3.1 Requirement of Application

Table show the frequency of feature based on segmentation of the variable. The result shows that mhealth applications are focusing 'Self directed' which have the highest frequency of feature (44%). It means there are many features that allow user

to have full control over the application of how they direct them self to achieve the goal.

	Variable with 2 coder	Frequency of feature
Self-directed	6	44%
Perceive choice	4	19%
Goal setting	2	20%
Responsible	4	17%

Table 5.3.2 Table Frequency of Application

Mapping variable of features

Construct	Dimension	Description of feature	Suggestion of features
Autonomy	Self-Directed	ASD1 (Personal Schedule): Function that allows for self-monitoring by recording info.	• Activity log
		ASD2 (Motivation) : Information addressing reason to participate/user volunteer	• Quote to achieve goal • Motivational photo
		ASD3 (Planner) : Function allowing one's own plan to lose weight	• User can chose to lose weight with exercise or diet
	Perceived Choice	APC1(Lose Weight Activity): Apps that offers at least more than 1 option to complete task	• Many ways to lose weight such as diet or exercise
		APC2 (Diary): Function that acknowledging individual perspectives.	• User can write notes • User log diary • Tips
	Goal Setting	AGS1 (Target): Feature that provides user-defined target goal.	• User set their target
	Responsibility	**AR1 (Advice): Duty or obligation to satisfactorily perform or complete a task that assigned.	• Role Play • Expert consultation • Recommendation
		AR2 (Reminder) :Feature that prompts the user to partake in a specific behaviour through the use of a predetermined alert.	• Alarm notification • Push notification

Table 5.3.3 Mapping of feature

5.4 Result

5.4.1 Discussion of Content Analysis

To calculate the reliability, ReCal2 that was created by Dr. Deen Freelon, was used which measure the extent to which coders agree with one another. If agreement is high, that means that a number of coders would agree that a piece of content should be coded in a given way. If agreement is low, that means that one coder would code that same content in one way, while another would code it in another.

There are a number of statistics that a researcher can use to measure agreement among coders in the context of a content analysis. They are:

1. Percent agreement
2. Scott's pi (π)
3. Cohen's kappa (κ)
4. Krippendorf's alpha (α)

Intercoder reliability, which also known as intercoder agreement, is the widely used term for the extent to which independent coders evaluate a characteristic of variable or artifact and get the same conclusion (Tinsley and Weiss, 2000). The intercoder reliability is not exactly the same as the correlation coefficient that measures the degree to which "ratings of different judges are the same when expressed as deviations from their means."

Coding may involve coders' judgments which vary among individuals. The quality of research depends on the understanding of coder. Practically, make it possible for the division of labor among multiple coders.

	Acceptance level	Description	Recommend to use or not
Percent agreement	80%	• does not correct for chance agreement	No
Scott's pi (p)	0.6	• address chance correction and systematic coding error problem	Acceptable
Cohen's kappa (k)	<0.00 Poor; 0.00-0.20 Slight; 0.21-0.40 Fair; 0.41-0.60 Moderate; 0.61-0.80 Substantial; 0.81-1.00 Almost Perfect. (Landis&Koch 1977)	• address chance correction and systematic coding error problem	Acceptable
Krippendorff's alpha (a)	$\alpha \geq .800$: the best result $\alpha \geq .667$:still acceptable	• address chance correction and systematic coding error problem	Acceptable

Table 5.4.1.1 Mapping of Technique

Coders need to understand the variables that were assigned to them. Coder need to code variables into coding scheme into Microsoft Excel. The goal is that all coders need to code the same content, if possible, with the same value. According to Klaus Krippendorf, the foremost living expert on intercoder reliability in content analysis, "agreement is what we measure; reliability is what we wish to infer from it".

Content analysis can be defined as the systematic, objective quantitative analysis of message characteristics (Neuendorf K.). It involves experiment the application, called coders, analyzing the application and describing the content variable. For this project, mobile health (mhealth) application were been reviewed. These apps are augmented by analysis of materials created by the application itself.

The reason to measure reliability is to demonstrate the trustworthiness (truthful) of data meanwhile measure reliability is measuring reproducibility. Different coders will receive the same training and textual guidance (variable) will assign the same value to the same piece of content. According to Krippendorff, in content analysis, reproducibility is arguably the most important interpretation of reliability. If intercoder agreement were not measure, reliability of data will unknown (taktahu) whether the conclusion that result from its analysis are accurate or misleading.

When intercoder reliability high, it means that different coders perceive a piece of content in the same way and code it accordingly. Coder may code the variable differently because they have different way of experiential, source and opinion. Variable (the list of variables, their values, and their definitions) were an important part to code the value because coders will refer to it often.

It is also useful to calculate intercoder reliability statistics on an ongoing basis throughout the coding process, not only during the training phase. This allows coders to have constant feedback on the quality of the coding. So, if there were problem of coding will immediately aware and the problem can be fixed. A good way to do this ongoing computation of agreement is to give coders a percentage of cases (80%)

which are coded by all coders. In order to calculate an intercoder reliability statistic all coders need to code the same case so that it's parallel.

i. Percentage Agreement

Percent agreement also called simple agreement is the easiest statistic to compute and to interpret. To calculate pairwise agreement, calculate the agreement between a pair of coders. Given only two coders and one observation, your results can only be 100% (they agree) ore 0% (they disagree). If you are working with multiple coders and multiple cases, then you calculate the average pairwise agreement among all possible coder pairs across observations.

However, the measure becomes more incremental when one uses more coders or more cases. For three coders, two of whom agree, the reliability is 33.3̄%. This calculation requires average pairwise percent agreement, in which the agreements of all possible pairs are calculated and averaged.

ii. Scott's pi (π) or Cohen's kappa (κ)

This section groups Scott's pi (π) or Cohen's kappa (κ) because both coefficients are for use only with two coders. They both improve upon percent agreement by factoring in the extent to which a given value will be coded by chance. While percent agreement is calculated based on observed agreement, both Scott's pi and Cohen's kappa also include a calculation for expected agreement in their equations. The difference in the equations is how this expected agreement is calculated. In fact, the underlying function of each is the same.

Scott's pi has been generalized to three or more coders by Joseph Fleiss, who created a statistics called (confusingly) Fleiss' kappa. Technically, calculate Cohen's kappa for more than two coders in the same way with calculate percent

agreement which is by calculating pairwise averages. Though Cohen's kappa can be computing in a pairwise manner, it is still demonstrated for content analysis. Krippendorff not agree with this statistic. The reason that Krippendorff dislikes Cohen's kappa is that it could consistent disagreement as expected agreement.

iii. Krippendorff's Alpha

Krippendorff's alpha (α) is the most reliable, but also the conceptually and computationally difficult. Scott', Cohen', and Fleiss' statistics measure observed and expected agreement meanwhile Krippendorff's equation measures observed and expected disagreement.

Also unlike the other weighted agreement statistics (Scott, Cohen, Fleiss), the coincidence matrices one uses to calculate Krippendorff require one to count all values rather than all decisions, which can be confusing.

Krippendorff's alpha has a number of benefits. It can be used for any number of coders (not just two). It can also be used for different kinds of variables. One of the features Krippendorff is best feature; it can be used for incomplete or missing data. Krippendorff's alpha uses a system of bootstrapping but which missing values are replaced with existing values samples from within the data set.

Acceptable Methods of Improving Agreement After the Fact

However, there are methods that Krippendorff endorses, specifically improving reliability for an entire data by removing unreliable distinctions from the data by recoding or dropping variables that do not meet the required level of reliability.

Krippendorff's standards are tough, but it is because it is serious about experimental and serious about producing reliable social science. Because digital activism is a new field, it may be possible to argue for lower standards of agreement. Researchers should aim to produce high-quality research. Producing data with low agreement means producing data that is unreliable, potentially misleading, and even wrong.

Variable	Percent Agreement	Scott's Pi	Cohen's Kappa	Krippendorff's Alpha
Function that allows for self-monitoring by recording info	**90**	**0.794285714**	**0.794285714**	**0.796**
Information addressing reason to participate/user volunteer	81.66666667	0.499810534	0.5	0.50397878
Function allowing one's own plan to lose weight	83.33333333	0.074074074	0.117647059	0.081790123
Apps that offers at least more than 1 option to complete task	80	0.215686275	0.230769231	0.222222222
Function that acknowledging individual perspectives	**88.33333333**	**0.695541863**	**0.696531792**	**0.698079014**
Feature that provides user-defined target goal	**90**	**0.79638009**	**0.796610169**	**0.798076923**
Duty or obligation to satisfactorily perform or complete a task that assigned.	86.66666667	0.127272727	0.139784946	0.134545455
Feature that prompts the user to partake in a specific behaviour through the use of a predetermined alert	81.66666667	0.540229885	0.540389972	0.544061303

N cases = 60
N decision = 120

Table 5.4.1.2 ReCal Result

Table above show the result after Recal2 test was held. For this project, Kriopendoff method was chosen to study the reliability of the data. Based on the result, there were different results that will determine whether the variable is

acceptable or not. For Krippendoff, $\alpha \geq .667$ are still acceptable but the best result is $\alpha \geq .800$. The variables that have below $\alpha \geq .667$ were removed because the data may not be reliable.

Variable that accept based on Krippendoff Alpha	Krippendorff's Alpha
Function that allows for self-monitoring by recording info	0.796
Function that acknowledging individual perspectives	0.698079014
Feature that provides user-defined target goal	0.798076923

Table 5.4.1.3 Accepted Reliability

5.4.2 Acceptable Agreement in the Reliability of Coding

i) Influence of the number of coders

The estimation of data reliability must thereby remain trustworthy with a minimal number of coders. The influence of the number of coders is obvious: detrimental (memudaratkan) standard deviations are found with small coders set sizes.

This finding concerns above all *multi*-k, *multi*-p and ab, which present very close behaviours on all annotations. One the opposite, the weighted a coefficient converges significantly faster to a trustworthy reliability measure. The comparison between a*b* and *a* is enlightening. It shows again that the main benefit of Krippendorff's proposal results from its accounting for a weighted distance in a multi-coders ordinal annotation.

For this research, there were two coder that assigned to review and collect the data based on variable that already been stated. High and low reliability of data was influenced by the coder because there were different coder may have different thought, opinion and ideas over their analysis.

After Recal2 analysis was done, there are only 3 variable that accepted based on the acceptable because Krippendoff method only accept alpha that have result that higher than .667. The coder may give an opinion and brief their idea through the discussion over the variable of the feature and agree with each other, that at the end, it give high reliability of that variable.

ii) Influence of coders set permutation

A coefficient for assessing the reliability of data must treat coders as interchangeable (Krippendorff, 2004). The stability of reliability measures computed on any combination of coders influence of permutation is quantified by a measure of relative standard deviation (e.g. related to the average value) among the sets of coders.

iii) Influence of the number of categories

Affective coding scheme enables a direct comparison between variables. At first, low inter-coder agreements are observed on affective annotation. Higher levels of agreement may have been obtained if the annotators were trained with supervision.

The data that been analysis need to achieve at least 80% of agreement before proceed to reliability analysis. The data that not achieve 80% need to review and the coders need to seat together and discuss the issue of the variable. Low percent of agreement will make the data have low reliability too.

Based on Krippendoff result, the lowest data is 0.081790123 from 'Self-directed' segment. Even 'Self-directed' is second highest frequency of feature but one of its variables has the lowest reliability because the data

have the least feature that fulfil user needed. Most of the developer of application does not have this feature in mhealth application.

iv) Issues of Scale

Extreme disagreement is statistically almost as unexpected as perfect agreement. It should not occur when coders apply the same coding instruction to the same set of units of analysis and work independently of each other, as is required when generating data for testing reliability.

Where the reliability of data is an issue, the worst situation is not when one coder looks over the shoulder of another coder and selects a non-matching category, but when coders do not understand what they are asked to interpret, categorize by throwing dice, or examine unlike units of analysis, causing research results that are indistinguishable from chance events.

While zero %-agreement has no meaningful reliability interpretation, chance-corrected agreement coefficients, it leaves researchers clueless as to what the data mean. For example, it is limited to nominal data; can compare only two coders2; and high %-agreement becomes progressively unlikely as more categories are available.

When there to many disagreement over the data, it will cause low reliability. The data cannot be interpreted because variable of the feature of mhealth application that was assigned may not helpful in the research. Based on frequency of feature result, it shows that 'Responsible' has the lowest frequency reading. It means that 'Responsible' variable was not too reliable. It has proven after Recal2 test was conducted where variable for 'Responsible' only 0.134545455 and 0.544061303 respectively which acceptable in Krippendoff needed at least $\alpha \geq .667$.

5.4.3 How to Establish Reliability

i) Sample of data

The sample of reliability data from which the trustworthiness of a population of data is to be inferred, have to be generated by coders that are widely available, follow communicable instructions (a data language), and work independently of each other. Reliability data must be representative of the data whose reliability is in question (not of the population of ultimate research interest).

The more coders participate to ensure the reliability of data. Coders must be interchangeable, may code different subsamples of data, provided there is enough duplication or overlap.

ii) Review and discussion the critical point

A decisive agreement coefficient should measure agreements within multiple descriptions, regardless of numbers and kinds of coders. Its values should be indicative of the likelihood that conclusions drawn from imperfect data are valid beyond chance. When data are ordered, it is advantageous to select a coefficient that responds to the information in their metric (scale characteristic or level of measurement) but assumes not more than warranted by the data in hand. α can handle multiple coders, nominal, ordinal, interval, ratio, and other metrics.

iii) Acceptable data

An acceptable level of agreement below which data are to be rejected as too unreliable must be chosen depending on the costs of drawing invalid conclusions from these data.

iv) Discuss the variable

All distinctions that matter should be tested for their reliability**.** Where a system of several variables is intended to support a conclusion the reliability of each variable should be measured and the smallest among them should be taken as the reliability of the whole system. Averaging the agreement measures of several variables, especially when included easily coded clerical ones, can easily mislead researchers about the reliability of variables that matter. This logic applies to individual categories as well.

Differences in frequencies of the categories of a variable influence the conclusions of a research effort the reliability of each distinction should be tested and the smallest one should be taken as the reliability of the whole variable. Resolving disagreements by majority among three or more coders may make researchers feel better about their data, but does not affect the measured reliability.

CHAPTER 6

RESULT AND DISCUSSION

6.1 Introduction

When working on analysis, it is really important to know whether the samples have passed or failed a test. Therefore, why do we need to do data analysis? Data analysis is to verify our results whether it is valid, reproducible and unquestionable. Even the industry do not interested in significance or insignificance of the data, but as a researcher must do data analysis.

For this chapter, it will explain about the result of previous analysis and what are the reasons that make the result to be like that. There will be explanation about result from the analysis and discussion that related to the result. There were few analyses and test that already conducted before the result were gained.

6.2 Result

6.2.1 Result qualitative and quantitative

After quantitative and qualitative were conducted, both result will be analyse.

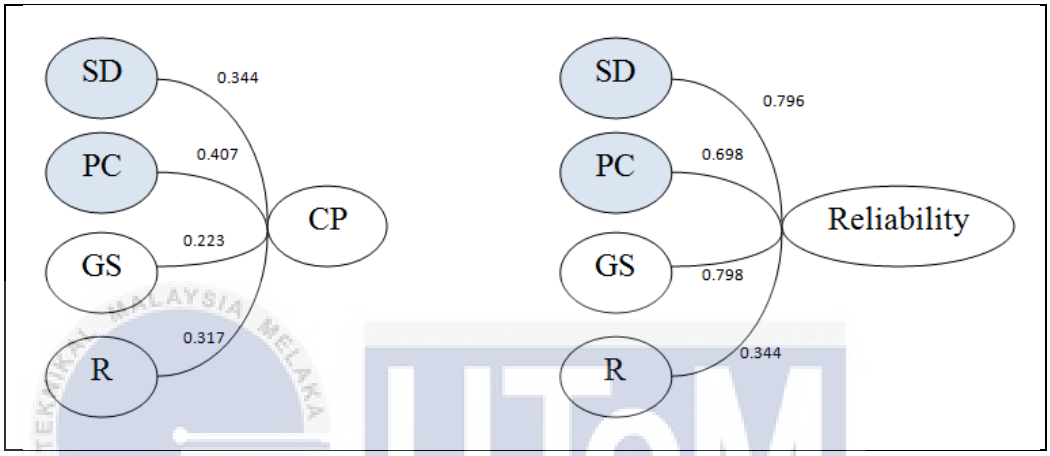


Figure 6.2.1.1 Illustrate of Significant Autonomy

Figure above shows autonomy mechanism that accepted based on the result. It shows that Self Directed and Perceive Choice were accepted autonomy based on requirement of the user and also accepted for mechanism that developer already proposed. Mechanism of Self Directed and Perceive Choice were accepted because both of it were significant.

Self-directed and perceive choice are the variable that have high significant because based on the research that has been conducted and the analysis result shows that the two variables that have been stated fulfil the requirement of the users as well as the offer from the developer. Most of the users more keen to chose that variable as it suitable with their requirement for their health monitor. As for the developer, they offer that features because it can involve the users in that application where the users really need those features.

For Goal Setting, even though the value for reliability was acceptable, Goal Setting cannot be accept because it not significant with what user want for their mhealth monitoring application. Target of individual may change depending on their thought from time to time.

And as for Responsible, it was not accepted because responsible is depends on user action. Developer cannot turn Responsible mechanism into an application form. It is because application of monitoring proposed for self control with force.

6.2.2 Result demographic factor

Before the result was gained, participants need to answer questionnaires that distributed at health centre and hospital. There were three sections of the questions. The first sections were asked about their personal information, also known as demographic information, that ask about their age, race, gender and occupation.

For second sections, the most asked questions were about how they monitor their health using an application and the third section were about campaign performance. After two weeks, the entire questionnaires were collected and data was analyses. From the result, the outcome shows that age and occupation have effect toward perceive choice of the autonomy.

There are 4 demographic factors studied in this research. From each demographic, it can be concluded into few hypotheses.

H1: Age has effect towards the autonomy variable.

i. Age have effect towards Self-directed
ii. Age have effect towards Perceive Choice
iii. Age have effect towards Goal setting
iv. Age have effect towards Responsible

H2: Race has effect towards the autonomy variable.

i. Race have effect towards Self-directed
ii. Race have effect towards Perceive Choice
iii. Race have effect towards Goal setting
iv. Race have effect towards Responsible

H3: Gender has effect towards the autonomy variable.

i. Gender have effect towards Self-directed
ii. Gender have effect towards Perceive Choice
iii. Gender have effect towards Goal setting
iv. Gender have effect towards Responsible

H4: Occupation has effect towards the autonomy variable.

i. Occupation have effect towards Self-directed
ii. Occupation have effect towards Perceive Choice
iii. Occupation have effect towards Goal setting
iv. Occupation have effect towards Responsible

After T-test analysis done, two out of four demographic were got reject null hypothesis. 'Reject null hypothesis' means the certain demographic that got reject gives an effect towards the variable of the autonomy. If the hypothesis was retaining, it means that the demographic do not give any effect toward the autonomy variable.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.170	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(age).	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.168	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (age).	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of selfdirected is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.421	Retain the null hypothesis.
2	The distribution of perceivedchoice is the same across categories of SMEAN(occupation).	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
3	The distribution of responsible is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.088	Retain the null hypothesis.
4	The distribution of goalsetting is the same across categories of SMEAN (occupation).	Independent-Samples Kruskal-Wallis Test	.407	Retain the null hypothesis.

Based on result above, it shows that two out of four demographic got rejected in null hypothesis after T-Test was conducted. Based on hypothesis above, there were only two were accepted for the next discussion:

1. H1(ii): Age have effect towards Perceive Choice
2. H4 (ii): Occupation have effect towards Perceive Choice

6.2.3 Discussion of demographic factor

Demographic of 'age' and 'occupation' prove that it can influence individual decision. As for the autonomy, 'perceive choice' have the most highest possible compared than others that can give effect towards the person's demographic.

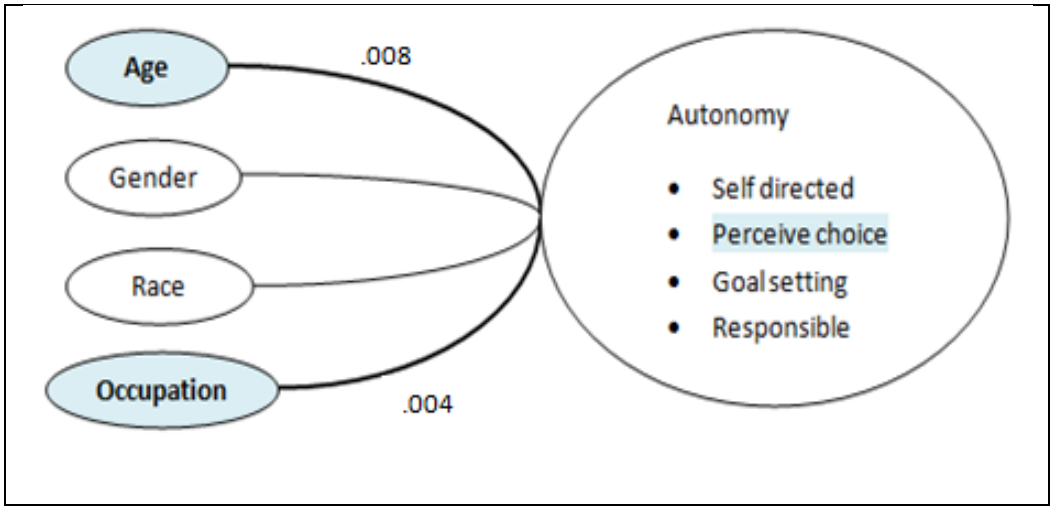


Figure 6.2.3.1 Illustrate of Acceptable Hypothesis

Based on the diagram above, it shows acceptable demographic that give an effect to the autonomy self-direction theory.

i) Age effect the perceive choice

For this research, it shows that age of individual can give an affect to their perceive choice. Self-perceptions of aging refer to individuals' perceptions of their own age and aging (Levy, 2003). Based on this article, it stated that there are two indicators of self-perceptions of aging; subjective age and aging satisfaction.

Subjective age is a multidimensional construct assessing facets, such as felt age, perceived age, or desired age whereas adolescents and younger adults often feel or want to be older than they actually are, middle-aged and older adults mostly report younger subjective ages. Aging satisfaction refers to the subjective evaluation of one's satisfaction with one's own aging process.

Across the lifespan, individuals are relatively satisfied with their aging, at least until relatively late in life or in proximity to death.

Adapting age	Preadolescence	9 – 11
The most active ages	Adolescence	12 – 19
	Young Adult	20 – 39
	Middle Adult	40 – 59
Less active	Mature Adult	60 – 79
	Old Age	80 +

Table 6.2.3.2 Illustrate of Age Categories

There are also few article and education material brief about the stages of human ages. There are many categories that can differentiate in term of human ages.

- Infancy (Ages 0-3): Vitality – The infant is a vibrant and seemingly unlimited source of energy. Babies thus represent the inner dynamo of humanity, ever fuelling the fires of the human life cycle with new channels of psychic power.
- Early Childhood (Ages 3-6): Playfulness – When young children play, they recreate the world anew. They take what is and combine it with what is possible to fashion events that have never been seen before in the history of the world. As such, they embody the principle of innovation and transformation that underlies every single creative act that has occurred in the course of civilization.
- Middle Childhood (Ages 6-8): Imagination – In middle childhood, the sense of an inner subjective self develops for the first time, and this self is alive with images taken in from the outer world, and brought up from the depths of the unconscious. This imagination serves as a source of creative inspiration in later life for artists, writers, scientists, and anyone else who finds their days and nights enriched for having nurtured a deep inner life.
- Late Childhood (Ages 9-11): Ingenuity – Older children have acquired a wide range of social and technical skills that enable them to come up with marvelous strategies and inventive solutions for dealing with the increasing pressures that society places on them. This principle of ingenuity lives on in that part of us that ever seeks new ways to solve practical problems and cope with everyday responsibilities.
- Adolescence (Ages 12-20): Passion - The biological event of puberty unleashes a powerful set of changes in the adolescent body that reflect themselves in a teenager's sexual, emotional, cultural, and/or spiritual passion. Adolescence passion thus represents a significant touchstone for anyone who is seeking to reconnect with their deepest inner zeal for life.
- Early Adulthood (Ages 20-35): Enterprise – It takes enterprise for young adults to accomplish their many responsibilities, including finding a home and mate, establishing a family or circle of friends, and/or getting a good job. This principle of enterprise thus serves us at any stage of life when we need to go out into the world and make our mark.

- Midlife (Ages 35-50): Contemplation – After many years in young adulthood of following society's scripts for creating a life, people in midlife often take a break from worldly responsibilities to reflect upon the deeper meaning of their lives, the better to forge ahead with new understanding. This element of contemplation represents an important resource that we can all draw upon to deepen and enrich our lives at any age.
- Mature Adulthood (Ages 50-80): Benevolence – Those in mature adulthood have raised families, established them in their work life, and become contributors to the betterment of society through volunteerism, mentorships, and other forms of philanthropy. All of humanity benefits from their benevolence. Moreover, we all can learn from their example to give more of ourselves to others.
- Late Adulthood (Age 80+): Wisdom – Those with long lives have acquired a rich repository of experiences that they can use to help guide others. Elders thus represent the source of wisdom that exists in each of us, helping us to avoid the mistakes of the past while reaping the benefits of life's lessons.

Based on understanding from this article, it can be related with this research. Individual with the most active age preferred to go to the fitness centre to keep their health in good condition. In general, individual with age 18 to 44 are at state where they are very active and have the most energy. People in active age with healthy physical can choose many type exercises for them to do. They have freedom to choose running, cycling, swimming or others activity. These shows that age can be related with perceive choice because categories of age can give different ability for someone to choose the activity they want to do. It is because there are limit for old age to do exercise since it can affect their health condition.

As in other article, it brief that old age is linked to both positive and negative stereotypes, negative attributes clearly outweigh positive ones. Both the activation of age stereotypes and age-related cues influence performance

and behaviour and are related to health and longevity, particularly in those who belong to the stereotyped group (Hess, 2006).

There are theory called ‘labelling theory’ suggests that when confronted with age stereotypes, older adults integrate the stereotypical information into their self-evaluation and therefore show the cause of effects. Findings that the priming of negative age stereotypes in older adults results in more age-typical performance such as slower gait or worse memory performance support the different result of effect idea. The opposite pattern emerged when primed with positive age stereotypes.

The idea from above explanation, it says that person with older age tend to have memory problem and have slow performance. It means that old age have limit choice for them to maintain their health. They cannot do heavy activity as it can affect their health. Old age people still can exercise but they need to choose the suitable activity for them. It is because their health and fitness level do not allow them to remain active.

The idea that individuals actively contrast themselves from stereotypes suggests that individuals are aware of the fact that they are confronted with stereotypes, awareness of stereotype priming might not be necessary in the context of labelling theory. Therefore, it could be speculated that high levels of stereotype prime awareness result in contrast effects, whereas low to moderate levels result in assimilation.

As described in this article, it says that stereotype priming procedure that was framed as an impression formation task should automatically activate age stereotypes in the participants without them being fully aware of the fact that stereotypes are being primed. Because health explains inter-individual differences in self-perceptions of aging (Levy, Slade, & Kasl, 2002) physical health as a moderator were included suggesting that individuals in bad health are particularly more influence to the negative effects of age stereotypes on self-perceptions of aging.

In sum, the empirical evidence on how employees of different ages perceive the potential of their workplaces as fostering or hindering their learning is equivocal. However, negative stereotypes about older employees may lead to certain kinds of task discrimination that then result in reduced workplace learning support for these employees.

ii) Occupation

Besides age, occupation also give an affect towards the perceive choice. In the other article, it explained that combination of accelerated technological advancements and increasing global competition has led to products and work processes having shorter life. Now days, permanent work-related change is now the rule rather than an exception, as are the needs for significant ongoing learning to sustain employability.

By meaning, fresh graduate with no experience cannot prepare individuals for all future work requirements where they might not fully understand the concepts or theory that have been taught. Thus, practical training is necessary for them to gain experience and knowledge before they proceed to the next level where they will get into the real working environment where it plays an important role as one of the important component when fresh graduate looking for job. Instead, all categories of employees will be required to engage in learning to meet the ever-changing demands of their workplaces.

Learning for work, therefore, is also shaped by how organizations design jobs and workplaces. In traditional, more 'top-down' oriented work organizations, employees are in charge of strictly predefined subtasks and are usually closely supervised and exercise very limited discretion (Appelbaum & Gallagher, 2000). Access to interactions and support in workplaces reinforces this effect by allowing employees to secure feedback about newly developed work behaviours, and opportunities to discuss, develop and appraise strategies that can respond to workplace challenges.

Some people might face problem to apportion their time between work and other ativities especially those who have career and commitment in their life. The individuals that are working need to segregate their working time to ensure they have time to stay healthy and fit. On the other hand, if they still want to spend some time to exercise, they need to do fair and wise judgement where they need to choose exercises that would not consume so much of their time.

Statement above means that individual that already in working phrase need to focus on their working life. From the excerpt above, most of people with career have no time to exercise due to workload that they have especially those who work in medical field where they do not even have enough time for themselves.

Based on the analysis that have been obtained from the survey it is clearly shows those who work in medical centre do not have time to conserve their health as well as to maintain healthy lifestyle. The analysis from the survey that have been done before also shows that the result from this survey corresponding with the perceive choice.

Many studies have provided experimental evidence for the importance of self-perceptions of aging in the context of successful aging. Given that positive self-perceptions of aging are associated with favourable outcomes, such as higher well-being, better health, or longevity, the question arises as to whether and how self-perceptions of aging can be influenced. One means for manipulating self-perceptions of aging in an experimental setting might be through the activation of positive or negative age stereotypes. This article also explains how individual age can affect someone's choice in making their own decision.

It follows that the support for ongoing learning in working life is becoming increasingly important for securing the kinds of learning outcomes that both workplaces and employees want and need. However, it is known that access to institutionalized learning opportunities is far from equal. Empirical

evidence indicates that older employees experience less development opportunities (for example, access to training programmes) than their younger counterparts.

6.3 Conclusion

In conclusion, this chapter was explaining and discussing about the finding and result from all the test and analysis that already done previously. The discussions including reason why happen like that, how to overcome it and many other discussions.

CHAPTER 7

PROJECT CONCLUSION

7.1 Introduction

In this chapter, it will focus on the final research conclusion. Summarization for the whole project will be explained. Besides, the project contribution, project limitation and future works will be include in this chapter. Hence, what this project can contribute to will be stated as well and there will be some limitation towards it and the limitation arises is stated and what can be enhanced from this project will be written as the things that need to be done in future works

7.2 Research Summarization

For research summarization, it will explain about the objective of the research. There are three objective that been focused on throughout the research. The first objective was to analyse the variable of autonomy to increase user participation in mobile health application.

The second objective was to analyse the impact of user demographic towards autonomy variables in mobile health application and the third and lastly was to compare autonomy variable with reliability of features in mobile health application.

7.3 Research Strengths and Weakness

Every project or research must have their own strength and weakness. As for this autonomy study, there were a few strength and weakness that can be concluded. The strength for this study:

1. There are many resource for researcher to understand the research because many previous researcher already done thus.
2. Autonomy study gives more understanding about human psychology in making decision.
3. Many other methods can also be applied.

Besides the strength, there were also having weaknesses. The weaknesses for this research include:

1. There are too many resources but they cannot decide which the best technique to use.
2. As for application review, there are many applications that need to purchase.

7.4 Research Contribution

This research can contribute as a guide and reference for upcoming researcher that interest to make research about psychology study. It also will be useful for them to choose which the technique to be used.

The first contribution was by doing the analysis. There were two analysis that need to be done; correlation analysis and content analysis. For correlation analysis, SPSS was used for this analysis to get the result of correlation. This analysis was to analyse autonomy variable correlate with campaign performance in usage of mhealth application in monitoring their health.

As for content analysis, intercoder reliability technique was used to get the result of reliability of the mhealth feature. There were many techniques from ReCal2. For

contribution of this research, a technique; Kripendoff, was chose. The result and technique then were analysis why the result becoming likes that. Then both correlation and content analysis compared.

The third contribution was analysis about demographic factor that acceptable that gives an effect towards autonomy variable. This analysis was conducted based on the hypothesis using T-test.

7.5 Research Limitation

1. Not all questionnaires were return back.

   The limitation that has been faced during the research is not all the questionnaires were return back. From all the questionnaires that have been distributed, some of the questionnaires were brought back and not being returned. Other than that, some of the respondents did return the questionnaires back but it was left unanswered.

2. Not all fitness centre willing to give corporation.

   For the second limitation is, not all fitness centres willing to give cooperation while this research was being conduct because they assume this project will disrupt their customers.

7.6 Future Works

At the beginning of research, there were many variable in Self-direction Theory. As for this research, autonomy variable was chosen. For the future work, they can choose other variable such as mastery or social for their research. The ideas of the research still the same but the content may be different.

7.7 Conclusion

In this section, there are three conclusions needed in this study according to its objectives.

Initial objective was determined to find any studies in correlation with the project title. This objective has been achieved in the early stage of this project. The information obtained from the studies was documented in chapter 1 until chapter 3.

Lastly, the third objective is related with the second objective. In order to make an analysis, the existence of data is important. An analysis was made solely based on the obtained data. This objective was partially achieved.

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