BANKING ON THE GO: FACTORS AFFECTING THE BEHAVIORAL INTENTION TOWARDS M-BANKING

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
BB	Baby Boomer
BIBM	Bank Islam Malaysia Berhad
BNM	Bank Negara Malaysia
CA	Cronbach's Alpha
CR	Composite Reliability
FAS	Faculty of Arts and Social Science
FBF	Faculty of Business and Finance
FEGT	Faculty of Engineering and Green Technology
FICT	Faculty of Information and Communication Technology
FSc	Faculty of Science
HTMT	Heterotrait- Monotrait Ratio
ICS	Institute of Chinese Studies
IDT	Innovation Diffusion Theory
IOS	Iphone Operating System
IT	Information Technology
M2U	Maybank2U
M2UMap	Maybank2UMap

M-Banking	Mobile banking
O	Original Sample
PEOU	Perceived Ease of Use
PLS	Partial Lease Square
PLS-SEM	Partial Least Square- Structure Equation Modelling
PR	Perceived Risk
PU	Perceived Usefulness
RA	Relative Advantage
SEM	Structural Equation Model
SMS	Short Message Service
T	Trust
TAM	Technology Acceptance Model
TAP	Transact on Palm
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAR	University Tunku Abdul Rahman
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

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PREFACE

The trend of mobile banking in U.S have grown gradually over the past 9 years. Most of the consumers stated that mobile banking is convenience and time saving, some of the consumers indicated that their use of mobile banking was driven by their bank or credit union starting to offer the capability. When mobile banking services first started, the mobile devices were not able to support all mobile banking services and they were lacking hardware and software support. However, technological advancements in mobile devices have enabled users to use mobile banking related services via SMS, and mobile web applications.

Furthermore, even though mobile banking services had started in Malaysia for 10 years, M-Banking in Malaysia is still in an infancy stage, this also motivates us to carry out a research to study the factors affecting the behavioral intention towards M-Banking in Malaysian context. Besides that, this study also examines how the independent variables (Perceived usefulness, Perceived Ease of Use, Perceived Risk, Relative Advantage and Trust) will affect the dependent variable (Behavioral Intention towards M-Banking). The research project will evaluate the M-Banking adoption among undergraduates in UTAR Kampar campus.

Lastly, it is hoped that this research project may provide the readers with a better insight and knowledge of the M-Banking adoption among Malaysian citizens.

ABSTRACT

The research is aimed to investigate the factors that affect the behavioral intention towards M-Banking among UTAR undergraduates in Kampar campus, which represent the 90s generation. The study examines the behavioral intention towards M-Banking by including independent variables of perceived usefulness, perceived ease of use, perceived risk, relative advantage and trust with the aid of TPB theory. Target respondents that included in the research are students from Faculty of Business and Finance (FBF) and students from Non FBF in UTAR Kampar equally by collecting data with a total of 400 sets of survey questionnaires. SmartPLS 3 is used to assist in our data analysis along the research. Reliability test, discriminant validity, significance of variables, bootstrapping is applied in the data analysis. The results concluded that the independent variables of perceived ease of use and relative advantage have significance relationship with the behavioral intention towards M-Banking among undergraduates' students. Conversely, perceived usefulness, perceived risk and trust have no significant effect on the behavioral intention towards M-Banking among undergraduates' students. Some limitations and suggestions are included in the study to provide a better idea for future researchers and M-Banking service providers to enhance the behavioral intention towards M-Banking in Malaysia.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

History of mobile banking will be discussed in detail in chapter one. Research objectives consists of general and specific research objective and research questions as well as hypothesis of research will be studied. Moreover, the exploratory research will discuss the chapter layout as well as the importance of the research.

1.1 Background of Study

In a modern era, mobile phone and internet which are the two main area of technology have undergone an acceleration and penetrated widely in our daily life. During the mid-1990s, wireless internet was enabled by the mobile technology suppliers and customer can go online through mobile phone. During that time, potential applications were innovated such as entertainment, education, productivity, news fees, finance, lifestyle and business (Barnes & Corbitt, 2003). Hence, mobile commerce expanded the potential by introducing their first commercial applications, mobile banking (M-Banking). In 2018, there are more than 4 billion of internet users and penetrated 53% around the world. The number of internet users is estimated going up 7% year on year. The key driver that increase internet users is the rapid development of more affordable smartphone and mobile data plans (Kemp, 2018). Hence, people can go online without geographical limitation with their smartphone.

Evolution of online banking to M-Banking has been developed that permits their customers to carry out transaction and manage their financial account through mobile devices or smartphone (Driga, 2015). The revolution of mobile banking technology has brought benefit to the financial institution. Banks can seek it as a new market opportunity to provide advantages to the current patron and reach new segment of customer that are not using mobile banking on emerging market (Gupta, 2013). Banks can offer several financial services to the customer such as funds transfer, updated stock price information with just one tap of the mobile devices. From the customer perspective, it has added benefit to customer to control their cash flow at anywhere and anytime to reduce their financial risk.

According to Driga and Isac (2014), mobile banking has been penetrated globally. Smartphone users begin to interact with bank in the detriment of other channels and M- Banking has evolved and penetrated quickly throughout the developing country. Development of smart phone application as well as advanced in technology has led to increase in adoption of M-Banking than internet banking by consumer. (Driga & Isac, 2014). However, although the penetration of M-Banking has gone worldwide, the usage of the M-Banking is not parallel with the penetration. According to Agwu, Okpara, Ailemen and Iyoha (2014), the usage of the M-Banking is lower in both developed and developing country. According to Malaysian Communications and Multimedia Commission (2018), Malaysian who use mobile phone has a rate of 131.2% but the mobile banking subscriber is only 35.4% among the Malaysia population.

Previous researchers had defined M-Banking in several ways. Barnes and Corbitt (2003) defined that customers uses smartphone as a channel to perform mobile banking services. Krugel (2007) specified M-Banking as financial institutions develop a new channel for payment infrastructure by using smartphone and interact with customer by delivering banking services. According to Agwu, et al. (2014), banks provide financial services by launching mobile banking application on smartphone that operate on android and Iphone Operating System (IOS) platform.

There were several studies had been done on the M-Banking. Laforet and Li (2005) discovered that customer of China has no alertness and not understand the advantage of mobile banking are the main barriers that affect their attitude to adopt it. Akturan and Tezcan (2012) found that attitudes of students were affected by the performance risk, perceived benefit, and social factors which are important in adopting M-Banking. According to Alalwan, Dwivedi, Rana and Williams (2016), they had studied the elements that affect Jordanian customers' intention toward M-Banking and found that perceived risk, perceived ease of use as well as perceived usefulness were the crucial elements that affect the behavioral intention toward M-Banking.

In Malaysia, Maybank was the pioneer financial institution to launch the mobile banking services by SMS mobile banking in 2002. In 2006, Maybank had launched the Maybank2U (M2U) mobile which capable with 3G mobile phone. While in 2009, Maybank has first announced the Maybank2UMap (M2UMap) for Iphone users in 2009. M2UMap provides variety of information include Maybank branch network, location of the automated teller machine and Maybankard Dining Treats Outlets in Malaysia. The most popular mobile banking services offered by Maybank are bill disbursement, prepaid top-up and money transfer ("Maybank introduces first ever mobile banking services information for iPhone applications in Malaysia", 2009). In 2010, Bank Islam Malaysia Berhad had firstly introduced the mobile banking application which does not require an internet access, Transact on Palm (TAP Mobile Banking-I) and operating on Short Message Service (SMS) platform. It does not require any application or software and compatible with all types of mobile devices. TAP has real-time access which users can perform transaction at anytime and anywhere ("TAP Mobile Banking-i", 2019).

1.2 Problem Statement

Malaysia's financial institution industry is looking to utilize advance technology by moving away the low competitive and low efficiency branch counter services to M-Banking. Besides, it also congesting the hall of bank and increase the amount of paper work for the client and banker. The establishment of M-Banking has been resulted in improved service quality and outstanding service provision in banking industry such as allow bank's client conduct numbers of financial activities through mobile device (Chandran, 2014). According to the data of Bank Negara Malaysia (BNM), mobile banking services has been introduced by 18 financial institution to their customers (Bank Negara Malaysia, 2019).

Table 1.1: *List of banks in Malaysia providing mobile banking services.*

1. Al Rajhi Banking & Investment Corporation (Malaysia) Berhad	2. Alliance Bank Malaysia Berhad
3. AmBank (M) Berhad	4. Bank Islam Malaysia Berhad
5. Bank Muamalat Malaysia Berhad	6. Bank of China (M) Berhad
7. Bank SimpananNasional	8. CIMB Bank Berhad
9. Citibank Berhad	10. Hong Leong Bank Berhad
11. HSBC Bank Malaysia Berhad	12. Industrial and Commercial Bank of China (Malaysia) Berhad
13. Malayan Banking Berhad	14. OCBC Bank (Malaysia) Berhad
15. Public Bank Berhad	16. RHB Bank Berhad
17. Standard Chartered Bank Malaysia Berhad	18. United Oversea Bank (Malaysia) Berhad

Source: Bank Negara Malaysia (2019). *List of Regulatees*

Although mobile banking is attractive to the bank's customers, but banks still need their customer to accept mobile banking (Liang, 2016). Ashta (2010) also stated that customers prefer to do banking in the traditional method by using branch counter services instead of using mobile banking.

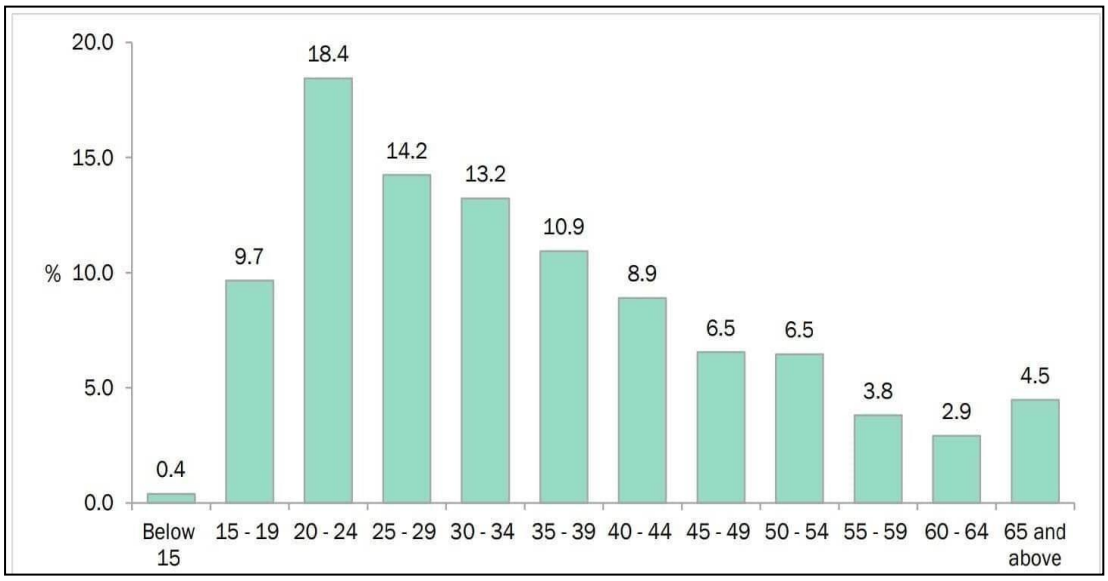
Therefore, even though Malaysia has started the mobile banking services for 10 years, the M-Banking in Malaysia is still in an infancy stage (Kasim, Ali & Mahathir, 2017). As reported by Malaysian Communications and Multimedia Commission (2018), Malaysian mobile phone user's penetration rate is 131.2% but the mobile banking subscriber is only 35.4% among the Malaysia population. Furthermore, according to the data of Bank Negara Malaysia (2019), transaction value through internet banking had increase RM 1.0898 trillion from year 2017 to 2018 while the transaction value of mobile banking was only increase 49 billion, it is clear that online banking is still the main channel for Malaysian to perform e-banking transaction.

Furthermore, according to Chandran (2014), a good mobile banking apps has more secure than internet banking when the user is making payment through the apps. Besides, Laukkanen, (2017) also stated that mobile banking offers benefits such as true freedom from place and time and efficiency for banking transaction compared to internet banking. However, the increase in subscribers of internet banking (4 million) is still higher than the increase in subscribers of mobile banking (3.09 million) from year 2017 to year 2018 (Bank Negara Malaysia,2019).

These finding implied that there are some causal factor influencing the usage of customer on the mobile banking services. Moreover, mobile banking can improve development of economic by facilitating the financial transaction (Bećirović, Bajramović & Ahmatović, 2011). Thus, this phenomenon is worth to investigate and further explore about the mobile banking adoption rate.

In addition, Batat (2009) stated that today's undergraduate students can use their mobile phone in other ways compared to adults as they are very eloquent in digital media. Bakar and Bidin, (2014) also found that Malaysian undergraduate students stated that possessing a mobile phone is a basic need in their daily life and the usages of mobile phone are common and fashionable but not only for social purposes only. Furthermore, the largest and second largest age group of Malaysians who using mobile phone are the age group of 20-24 and 25-29 which accounted 18.4% and 14.2% respectively (Malaysian Communications and Multimedia Commission, 2018).

Figure 1.1: Percentage distribution of hand phone users by age category



Adapted from: Malaysian Communications and Multimedia Commission. (2018). *Hand Phone Users Survey 2017*

In addition, Govender and Sihlali, (2014) also stated that populations of university students are the most favorably place in the adoption of technology and innovation. Therefore, this principle of this research is to find out the factor affecting the M-Banking's adoption with UTAR undergraduate students.

1.3 Research Objectives

1.3.1 General Objectives

The research objectives of the research are to investigate the factors that affect the adoption of M-Banking among UTAR undergraduates in Kampar campus.

1.3.2 Specific Objectives

i. To investigate the relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

ii. To investigate the relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

iii. To investigate the relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

iv. To investigate the relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

v. To investigate the relationship between trust and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

1.4 Research Questions

i. Is there any significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus?

ii. Is there any significant relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus?

iii. Is there any significant relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus?

iv. Is there any significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus?

v. Is there any significant relationship between trust and behavioral intention toward M- Banking among UTAR undergraduates in Kampar campus?

1.5 Hypothesis of Study

The researchers have established the hypothesis to examine the association between behavioral intention toward M-Banking and perceived risk, relative advantage, perceived usefulness, trust and perceived ease of use.

1.5.1 Perceived Usefulness

$H_{0:}$ There is no significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

$H_{1:}$ There is a significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

1.5.2 Perceived Ease of Use

$H_{0:}$ There is no significant relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

$H_{1:}$ There is a significant relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

1.5.3 Perceived Risk

$H_{0:}$ There is no significant relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

$H_{1:}$ There is a significant relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

1.5.4 Relative Advantage

$H_{0:}$ There is no significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

$H_{1:}$ There is a significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

1.5.5 Trust

$H_{0:}$ There is no significant relationship between trust and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

$H_{1:}$ There is a significant relationship between trust and behavioral intention toward M- Banking among UTAR undergraduates in Kampar campus.

1.6 Significance of Study

The research can assist financial institution to encourage their consumers to adopt M-Banking services. It also assists financial institutions to find out the primary concern of banks' customers when utilize M-Banking services. For instances, customers may concern about the perceived risk and relative advantage when using M-Banking. Hence, this study will provide significant information to financial institutions to strengthen their product to their customers.

Previous researchers found that there are many previous researches on this topic among other countries and there is little research in Malaysia. Hence, this research can bring a great effort to the future researchers who want to discover further in the topic of M-Banking in Malaysia. This study is significant in providing the M-Banking's information which future researchers can bridge the gap by investigating the components that contribute to the M-Banking adoption in Malaysia.

On the other hand, software engineers will be benefited from this study. The result of the study will contribute a vital vision for them to develop and carry out M-Banking services which can rise the usage of the services. Hence, software engineer should prioritize on developing the M-Banking facilities based on the factor such as perceived risk, relative advantage, perceived usefulness, trust and perceived ease of use to boost the M-Banking adoption.

1.7 Chapter Layout

Chapter One consists of the history of mobile banking and justification of the researches on mobile banking. Besides, the researches will propose the general and specific research objectives and questions. In addition, notable of study will be discussed in detail as well.

Chapter Two establish a literature review and theoretical framework which consists of past researchers' viewpoint that have introduced to the research area. Proposed conceptual framework and hypothesis development are covered as well.

Chapter Three address methodology which include research process and research design. In addition, sampling design, construct measurement and data finding will be introduced. Primary data is used, and pilot test is conducted in this chapter.

Chapter Four constitutes data analyses. Result from Smart PLS 3.0 for structural equation modelling will be interpreted in this chapter.

Chapter Five carry out the discussion of the result and achieve the research objective. The chapter encompass implication, restriction and recommendation of the study

1.8 Conclusion

Chapter one has examined the backdrop of the mobile banking and motivation of the study. Research objectives together with question along with notable of research are investigated as well. Further information for the variable will be deliberate in coming up chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Articles and journals have been reviewed that related to this topic. Moreover, review of theoretical framework has been conducted and conceptual framework will be proposed based on the theories supported. Lastly, hypothesis development will be established to investigate the association between the variables.

2.1 Review of the Literature

2.1.1 Perceived Usefulness

The meaning of perceive usefulness (PU) is the expectation of user that her or his performance of the job will be improved by using an application software (Akturan & Tezcan, 2012). Hence, the user might prospect they will be benefited when using mobile banking services. Mortimer, Neale, Hasan and Dunphy (2015) had carried out a study to investigate the motivators that influencing the intentions of a consumer to use M-Banking. The researchers performed website-based questionnaire to perform data collection from 340 responders who are from Thailand and Australia. In this study, the path and invariance analyses, exploratory and confirmatory factor analyses had use by

the researcher to analyze the data collected from the respondents. The result demonstrated that the perceived usefulness and the consumer's intention to adopt M-Banking in Thailand and Australia are significant positive related. This is similar with the research that conducted by Zhang, Lu and Kizildag (2018) which aim to examine the factor that affecting the adoption of M-Banking services. In this research, an online survey had been used to test proposed association between the factors and the M-Banking adoption of by consumers. The researchers had applied Structural equation modeling (SEM) in order to analyze the intention of the consumers toward M-Banking. The result showed that perceived usefulness was identified as a important factor that affecting the adoption of M-Banking services by consumers.

AI-Jabri (2015) had conducted a research to examine and develop research model to study the factor influencing the intention of consumers from Saudi Arabia toward M-Banking services. Paper-based survey had been performed and Partial Lease Square (PLS) had utilized to empirically test the model. Contrary to other research, it founds that relationship between perceived usefulness the intention toward M-Banking is not significant. This may due to most of the respondent never used mobile banking before, thus, they are unable to express their perception toward M-Banking services accurately and the usefulness of M-Banking is difficult to evaluate.

Moreover, Daud, Kassim, Said and Noor (2011) had conducted a study to investigate the important factors which affecting the mobile banking adoption of Malaysia's banking users by applying extended Technology Acceptance Model. The data was gathered from 300 banking users by using surveys. Perceived usefulness had been stated to have important association with the intention toward mobile banking. This is consistent with the research that carried out by Amin, Hamid , Lada and Anis (2008) which aim to investigate the factors that determine intention to use M-Banking among Bank Islam Malaysia Berhad (BIMB). Based on the result analyzed among BIMB

consumers by applying Technology Acceptance Model (TAM), perceive usefulness is strong determinant of behavioral intention toward M-Banking service.

Table 2.1: *Summary of Past Studies – Perceived Usefulness*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Usefulness	Mortimer, Neale, Hasan and Dunphy (2015), Zhang, Lu and Kizildag (2018), Daud, Kassim, Said and Noor (2011), Amin et al (2008)	-	AI-Jabri (2015)

2.1.2 Perceived Ease of Use

Contradicting finding were found in researches conducted in African and Middle East countries. In a study conducted by Alalwan, Dwivedi, Rana and Williams (2016), 500 Jordanians from Amman and Al-Balqa' city was investigated on their intention toward mobile banking. The researchers used survey questionnaire to find out the key factors based on Technology

Acceptance Model (TAM) with self-efficacy and perceived risk as the external factor. The results demonstrated a notable association amid perceived ease of use with behavioral intention toward M-Banking. As reported by Hanafizadeh, Behboudi, Koshksaray and Tabar (2014), similar results were found on 403 Iranian where the researchers examined eight adoption factors on intention to utilize mobile banking. Data was analyzed through structural equation modeling and found that all the factors, including perceive ease of use has an impact on the motive of mobile banking adoption. However, Makanyeza (2017) stated that perceive ease of use shown insignificant consequences on behavioral intention toward M-Banking service adoption, but it shows significant positive relationship with perceive usefulness and has impact on motive to adopt M-Banking. 232 bank users in Zimbabwe will be surveyed and analyze with structural equation modeling.

In this research, several journals in similar setting was reviewed and demonstrated that perceive ease of use is the important elements in predicting M-Banking adoption. Hanudin, Baba and Muhammad (2007) conducted their survey on 239 bank customers in Malaysia, while Govender and Sihlali (2014) surveyed 71 university students in Italy. Hanudin, Baba and Muhammad (2007) found that the results significantly support extended TAM model, where behavioral intention toward M-Banking and perceived ease of use are positively associated. While Govender and Sihlali (2014) stated that behavioral intention toward mobile banking is insignificantly affected by the elements of perceived ease of use.

Table 2.2: *Summary of Past Studies – Perceived Ease of Use*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Ease of Use	Hanudin, Baba and Muhammad (2007), Hanafizadeh et al. (2014), Alalwan et al. (2016)	-	Makanyeza (2017), Govender and Sihlali (2014)

2.1.3 Perceived Risk

Chansaenroj and Techakittiroj (2015) had conducted a research to explore the factors that affecting the intention of using M-Banking in Thailand, which the results were conducted on 400 respondents in Bangkok. The results showed that perceived risk, together with perceived ease of use and perceived usefulness, is significantly related with the intention of mobile banking. Also, similar results were also found in a research, which conducted on 100 customers of a bank in India where the researcher investigated on the elements which influencing the adoption of M-Banking among users under five major factors (Yadav, 2016). The researcher stated that four of the five major factors, which included perceived risk, had significant and positive relationship to the use of M-Banking services.

As reported by Abadi, Kabiry and Forghani (2013), 310 Isfahanian from Isfahan city was conducted to explore on the factors that affect the M-Banking services adoption. The researchers conducted questionnaires to investigate the main factors by using Technology Acceptance Model (TAM) and further studying the effects of perceived risk, compatibility and trust on behavioural intention. The result showed perceived risk and the adoption of M-Banking services is negatively related. Furthermore, the paper of Taleghani and Taleghani (2016) had investigated on the factors that will influence decision of consumer on M-Banking adoption based on SMS services. The researchers conducted their survey questionnaires on 411 bank customers in Rasht city and the findings revealed that perceived risk and the M-Banking adoption is negatively related.

Priya, Gandhi and Shaikh (2018) obtained the cross-sectional survey from 269 respondents from India to investigate the factors which influencing the young consumers from India on M-Banking Adoption. The results concluded that perceived risk and the intention of M-Banking adoption is insignificantly related, but perceived usefulness is stated as most significant factor that can affect the M-Banking adoption of consumers. The outcome is similar with the study of Leiva, Climent and Cabanillas (2017), which surveyed 103 respondents to explore the factors of M-Banking adoption. The study developed a TAM model that merges the innovation diffusion theory; perceived risk and trust are added to the classic TAM in order to clarify on the factors that find out the user acceptance of M-Banking applications. Leiva, Climent and Cabanillas (2017) found that both the perceived risk, along with perceived usefulness and the adoption of M-Banking is insignificantly related due to the experience effect already commented.

Table 2.3: *Summary of Past Studies – Perceived Risk*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Risk	Chansaenroj and Techakittiroj (2015), Yadav (2016)	Abadi, Kabiry and Forghani (2013), Taleghani and Taleghani (2016)	Priya, Gandhi and Shaikh (2018), Leiva, Climent and Cabanillas (2017)

2.1.4 Relative Advantage

Mobile banking itself can be referring as a technology or new invention to the market. Innovation Diffusion Theory (IDT) proposed by Roger in 1995 suggested relative advantage as the factor that influencing adoption of new technology. Similar to the research developed by Tanakinjal, Deans and Gray (2010), the investigation explored the potential elements that influencing the intention to utilize mobile marketing of the mobile user which including the relative advantage. The research also suggested the factor of relative advantage happened to be the strongest to influence the intention decision of the consumers to adopt M-Banking among seven potential factors. Research in South Africa exhibits that there are elements influencing the users on M-Banking adoption namely; relative advantage, customer needs, lower perception of risk and trial-ability (Brown, Cajee, Davies & Stroebel, 2003).

Relative advantage shows the degree of an individual view an invention as contributing values towards the past ways or methods of operating the particular same task (Taylor & Todd, 1995). Profitability, social reputation, time and effort saving, decrease of discomfort are usually expressed to the extent of relative advantage (Roger, 1995). Relative advantage derive from mobile banking service is when the M-banking facility is acknowledged to be better than using its precursor. The consumers are more likely to accept the innovation as they have better view of the new technology than its precursor (Chitungo & Munongo, 2013; Shaikh & Karjaluoto, 2015). This move in tandem shows that relative advantage and adoption of M-Banking has a positive relationship. The intention to act is positively affected by the relative advantage and thus influences the intention toward M-Banking (Lee, McGoldrick, Keeling & Doherty., 2003; Al-Jabri & Sohail, 2012; Makanyeza, 2017). Practically, when the users trusted M-Banking would earn more relative advantage like greater convenience and time saving as compared to convention style of banking methods such as the machines or off-line transaction, they are more anticipate to adopt the M-Banking facility (Cheah et al., 2011). In general, as customers perceive advantages from M-Banking, they are prone to have positive conviction to adopt it (Lin, 2010).

Numbers of research presented perceived relative advantage primarily and significantly affect the intention toward M-Banking (Khraim, Shoubaki, Shoubaki & Khraim, 2011; Akturan & Tezcan, 2012). Chitungo and Munongo (2013) suggested relative advantage as an identified merit of using a particular product or service. The result of this research also denoted that a significant and positive path of relative advantage toward M-Banking adoption. In Brazil, a research had done by comprising the user and non-user of the mobile banking which the result showed both user and non-user are statistically significant to M-Banking adoption (Püschel, Afonso Mazzon & Mauro C. Hernandez, 2010). However, relative advantage is more significant for user than non-user. According to the research regarding adoption of M-Banking in

consideration of gender as moderating variable, male users are more apt to relative advantage from M-Banking to judge its usefulness (Riquel & Rios, 2010). The findings of the research had shown adding gender into Technology Acceptance Model (TAM) as complementary variable is significant and useful. With targeting their communication tactics according gender, result demonstrated relative advantage is more important for male than female in Singapore.

Table 2.4: *Summary of Past Studies – Relative Advantage*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Relative Advantage	Lee et al. (2003), Cheah et al. (2011), Khraim et al. (2011), Akturan and Tezcan (2012), Al-Jabri and Sohail (2012), Lin (2010), Püschel et al. (2010), Makanyeza (2017)	-	-

2.1.5 Trust

Based on study of Pamungkas and Kusuma (2017), the researchers had explored the connection between initial trust and the M-Banking adoption in Indonesia. This study collect data from 159 bank's customers adopting and 75 without adopting of M-Banking. The study discovered that the connection between initial trust in the electronic channel and the implementation of mobile banking was positive. The result stated that trust owned by the mobile banking users were a substantial factor encouraging mobile banking adoption. In the study of Liu, Min and Ji (2009), Technology Acceptance Model (TAM) was used to examine the role of trust according to a multi-dimensional perspective which were trust in technologies, suppliers and structural certainty in adopting the M-Banking. 438 questionnaires were distributed to responders to investigate the results. The study concluded that trust in M-Banking suppliers has a positive effect on overall trust, that trust in technologies has also been discovered to have a positive significant effect on the creation of overall confidence and user trust in suppliers, and that trust in suppliers among people has been discovered to be considerably influenced by technological confidence.

Chiu, Bool and Chiu (2017) obtained survey from 314 respondents from Philippines to examine the element that affecting behavioral intention and initial trust in using M-Banking in Philippines. Hayes' Process Macro was used to estimates the path coefficients. The result showed a positive significant connection between behavioral intention and initial trust in using mobile banking services. Moreover, based on study of Hanafizade, Behboudi, Koshksaray, and Tabar (2014), 361 bank clients in Iran were investigated to carry out the components that affecting the utilization of M-Banking service in Iran. In the research, in explaining the M-Banking adoption, trust was discovered to be the most important and beneficial antecedents.

According to study of Singh and Srivastava (2018), 855 bank customers from India's banks were selected to investigate on the components affecting adoption of M-Banking in India. The result showed insignificant relationship between trust and the M-Banking adoption services. The researchers stated that trust may seem insignificant of the fact that clients consider banks are the most reliable organizations. In addition, Koenig-Lewis, Palmer and Moll (2010) had researched on the study on barriers for adopting mobile banking services. 263 young people in Germany were being investigated through online survey to discover the main factor in influencing M-Banking adoption. The results concluded that trust have no association with the use of M-Banking service.

Table 2.5: *Summary of Past Studies – Trust*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Trust	Pamungkas and Kusuma (2017), Liu, Min and Ji (2009), Chiu, Bool and Chiu (2017), Hanafizade, Behboudi, Koshksaray, and Tabar (2014)	-	Singh and Srivastava (2018), Koeing-Lewis, Palmer and Moll (2010)

2.1.6 Behavioral Intention toward M-Banking

According to Priya, Gandhi and Shaikh (2018), young consumers in India were targeted to study the elements associated to M-Banking adoption. The element of user satisfaction is considered as mediating factors in the study. 269 participants' data has been obtained through electronic survey who has the age from 23 to 29 years old and perceived risk was the insignificant elements in arousing the mobile banking adoption.

Tan and Leby Lau (2016) has discovered the millennials perspective on the M-Banking adoption in Malaysia. Kuala Lumpur was chosen as sampling location and university students are the target respondent in this study. 384 questionnaires were used, and they stated behavioral intention toward mobile banking was significantly affected by all the variable.

Besides, Hanudin, Baba and Muhammad (2007) also did an exploration on the elements determine the M-Banking adoption of the bank patron in Kota Kinabalu and Labuan by lengthen the existing Technology Acceptance Model (TAM). Data of 250 bank patrons were collected using survey questionnaires. In their findings, only normative pressure was found to be insignificant associated with the behavioral intention.

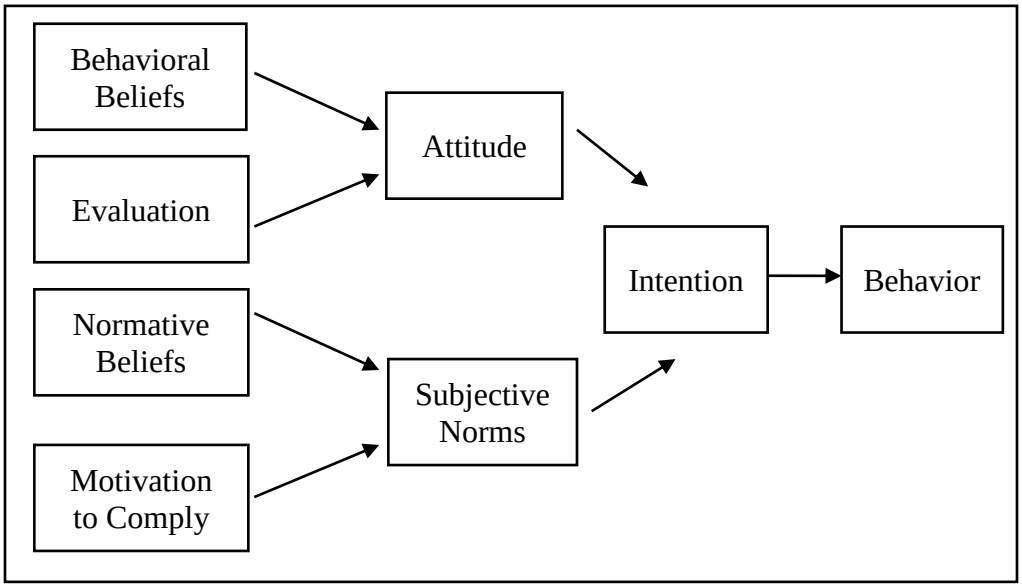
According to Alam (2014), an empirical study has been done on mobile banking adoption in Bangladesh. UTAUT model was adopted in this study and 225 data were collected from diversified respondent in Dhaka City. The finding shows perceived credibility, facilitating condition and perceived self-efficacy are insignificant. Besides, an extended UTAUT model has been used by adding two variables which are perceived credibility and personal innovativeness in studying mobile banking adoption in Bangladesh (Islam,

Karia, Soliman, Fouji, Khalid & Khaleel, 2017). Questionnaire were used and the data were analyzed by Structural Equation Model (SEM).

2.2 Review of Relevant Theoretical Model

2.2.1 Theory of Reasoned Action (TRA)

Figure 2.1: Theory of Reasoned Action (TRA)



Adapted from: Ajzen and Fishbein (1975). Theory of Reasoned Action

In 1975 Martin Fishbein and Icek Ajzen developed a theory which originated from social psychology field, namely Theory of Reasoned Action (Ajzen &

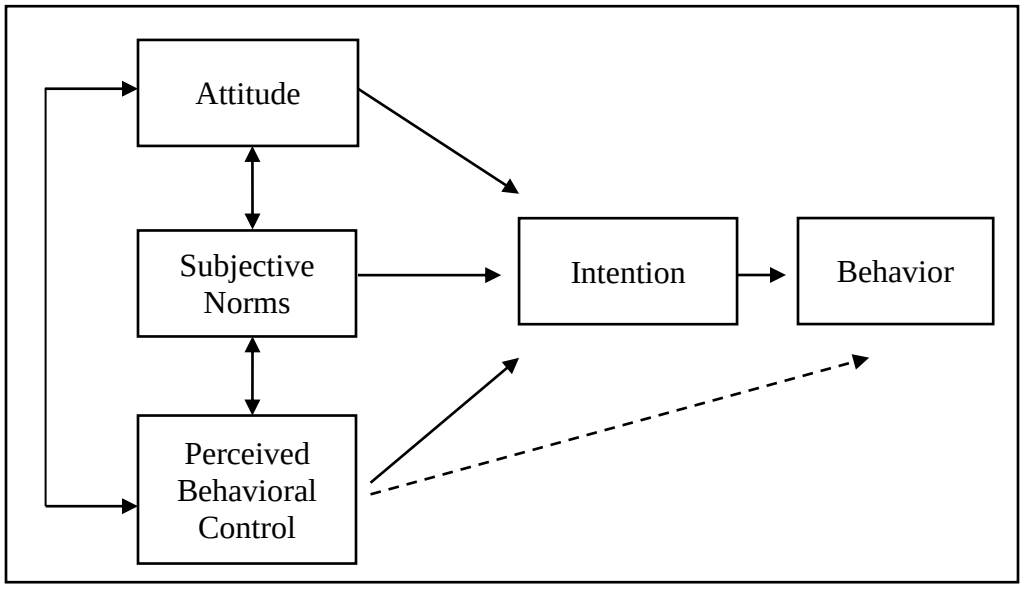
Fishbein, 1970). It focuses on an individual intention to act in certain way. The intention refers to the plan or odds that an individual will or will not actually behave way. The main determinants of behavior are attitudes and subjective norms which helped to understand the behavioral intent. The attitude is a person's belief and the evaluation of consequences which is the potential outcomes. While subjective norm represents the relevant individual or groups' perception of belief, whether the action is approved or disapproves. Also, the theory is worked as an improvement of Information Integration Theory by Norman Anderson. Rather than focused on forecast the attitude as proposed in Information Integration Theory, TRA model explicitly focused with the behavior (Madden, Ellen & Ajzen, 1992).

The research done in Philippines from Chiu, Bool and Chiu (2017) on evaluation of potential antecedents of trust, moderators and mediators that affect behavioral intention to employ M-Banking founded on TRA model and Theory of Planned Behavior (TPB) which is the evolution of TRA model. A review on behavioral intention without the adoption of TRA and TPB study is proposed by integrating the positive and negative factors. McKnight, Cummings and Chervany (1998) stated that behavioral intentions regarding the consumer protection, objective and forwardness as a confidence contrast to conduct some specific behaviors which are following advices, providing personal information and purchasing goods and services. The three behavioral intentions are known as trust-related behaviors which is the outcomes of trust. Technology Acceptance Model (TAM) explained the degree of the user regarding the compliance of Information Technology (IT) depend on the origination of TRA in the research of Gu et al. (2009). It is a conceptual model of construing users' acceptance of new IT in adaption of TRA. The result from the research of TAM in adaption of TRA showed that trust is crucial in increasing behavioral intention to employ mobile banking. According to Püschel et al. (2010), the characteristics of innovation like the innovation adoption frameworks and theories are derived from TRA based on

the Innovations Diffusion Theory (IDT). The study defined behavioral intention as the objective toward or prolongs using from both non-user and user of M-Banking respectively. As for the non-M-Banking user, the intention toward and recommends this service is the measurement of the behavioral intention. While M-Banking user, maintaining current use and usage frequency is projected for behavioral intention.

2.2.2 Theory of Planned Behavior (TPB)

Figure2.2: Theory of Planned Behavior (TPB)



Adapted from: Ajzen (1991). The theory of planned behavior.

Ajzen (1991) has suggested the Theory of Planned Behavior that extended from the Theory of Reasoned Action (TRA). It is an important assumption for the estimation of any behavior on the defined social situation (Kiriakidis, 2015). This theory can explain all the behaviors over people, which can

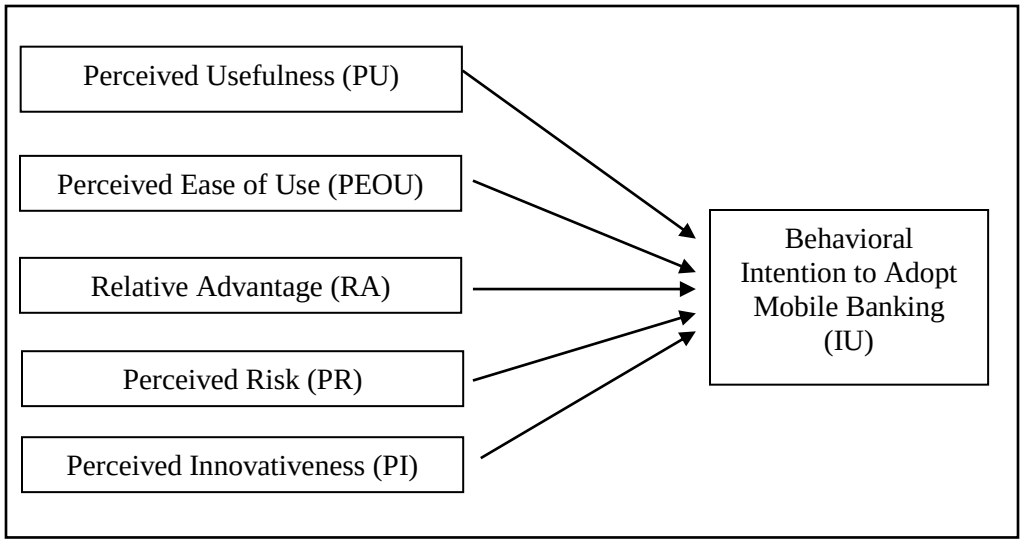
exercise self- control. According to the research of Ajzen (1991), subjective norms, perceived behavior control as well as attitudes to a foundation of beliefs about the behavior was remained in this model.

The research of Abdulkadir, Galoji and Razak (2013) was studied the important elements that influencing users' adoption of M-Banking services by using TAM and TPB model. The research stated the social influence is the main factors in facilitating or deterring the adoption of M-Banking services. Lee (2009) explored and investigated the factors affecting the consumers' behavioral intention to use internet banking based on an extended TAM with a TPB model. Lee (2009) also stated that many researches have used TAM and TPB to estimate and understand about the user's perception on system use, the probability of adopting and acceptance toward IT. Giovanis, Athanasopoulou, Assimakopoulos and Sarmaniotis (2019) as well as Aboelmaged and Gebba (2013) investigated the determinants of M-Banking adoption through TAM and TPB model. Theory of planned behavior (TPB) and Technology Acceptance Model (TAM) have attracted most consideration and acceptance in an ample areas and applications to find out intention of user to adopt new technology and systems (Aboelmaged & Gebba,2013).

2.3 Proposed Theoretical / Conceptual Framework

2.3.1 Conceptual Framework

Figure 2.3 Conceptual Framework



Adapted from: Cheah, C. M., Teo, A. C., Sim, J. J., Oon, K. H., & Tan, B. I. (2011). Factors affecting Malaysian mobile banking adoption: An empirical analysis. *International Journal of Network and Mobile Technologies, 2*(3), 149-160.

The researchers explored the elements that influence M-Banking implementation in Malaysia. Perceived usefulness, perceived ease of use, relative advantages, perceived risk, personal innovativeness were examined by researchers as elements that affected the use intention of the M-Banking. All

these variables were discovered to have explained the utilization of M-Banking service effectively of Malaysian clients.

The researchers discovered the perceived usefulness had a positive impact on utilization of M-Banking in Malaysia. This showed benefit of using M-Banking is realize by the financial institution's clients to carry out their banking activities. Hence, if more useful service is provided, user will have more intention to use M-Banking.

Moreover, it was discovered that perceived ease has a relationship in affecting M-Banking's use intention. From the research, ease of use skill acquisition was discovered to be more efficient than usage difficulty and learning ease. Thus, the adoption will increase when customers found the usage of M-Banking is easy to learn.

Furthermore, relative advantages were a positive significant factor in affecting banks' client in adopting M-Banking. The more relative benefits that consumers perceive, the greater the chance of adopting M-Banking for banks ' customers. Therefore, banks should highlight the advantages they can deliver in attracting the intention of the client.

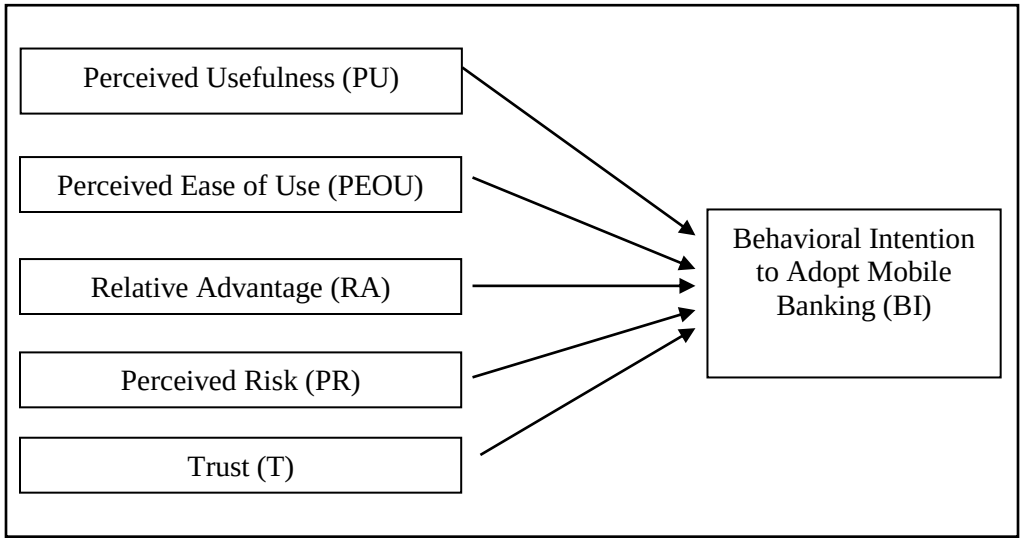
In addition, the outcome discovered that perceived risk had a negative significant effect on the implementation of M-Banking. A person believes that security problem and privacy threats may occur when using mobile banking which substantially determine the purpose of using M-Banking in societies with a strong inclination to avoid uncertainty. Therefore, greater customers' acceptance rates can be produced by providing a higher safety in M-Banking services.

Lastly, the M-Banking adoption can influence by personal innovativeness.

The use intention among clients is discovered to have a positive significant impact, which implies that M-Banking is mostly accepted by those highly innovative consumers. Hence, banks can formulate advertising approach to attract ' innovators ' and ' early adopters. '

2.3.2 Proposed Theoretical Framework

Figure 2.4 Proposed Model



In this study, the main framework which are TPB was used to investigate the M-Banking as it is high valid approach. Besides, ‘Trust’ has been added as new elements in the research.

2.4 Hypothesis Development

2.4.1 Perceived Usefulness

H_0: There is no significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus

H_1: There is a significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

Previous studies had concluded that the perceived usefulness of the M-Banking is a strong factor that affecting behavioral intention toward M-Banking. As reported by Mortimer, Neale, Hasan and Dunphy (2015), the relationship between the perceived usefulness and the intention of a consumer to adopt mobile banking services are positive related. This was agreed by Zhang, Lu and Kizildag (2018) which stated that the perceived usefulness had been identified as an effective factor that influencing M-Banking adoption by consumers. In addition, perceived usefulness is significant related to the intention toward M-Banking service in Malaysia (Daud, Kassim, Said, Noor, 2011) and the result of this study is similar with the study done by Amin et al. (2008) which stated that perceived usefulness is strong determinant of behavioral intention toward M-Banking.

2.4.2 Perceived Ease of Use

H_0: There is no significant relationship between perceived ease of use and behavioral intention toward M-banking among UTAR undergraduates in Kampar campus

$H_{1:}$ There is no significant relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus

Previous studies found that a strong determinant of behavioral intention toward mobile banking abide of perceived ease of use. Alalwan, Dwivedi, Rana and Williams (2016) have investigated the intention toward mobile banking among Jordanians and believed perceived ease of use shown symbolic association with behavioral intention of M-Banking adoption. It is agreed by the research done by Hanafizadeh, Behboudi, Koshksaray and Tabar (2014) which they concluded perceived ease of use is crucial to determine the intention toward mobile banking in the midst of Iranian.

2.4.3 Perceived Risk

H_0: There is no significant relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

H_1: There is a significant relationship between perceived risk and behavioral toward M- Banking among UTAR undergraduates in Kampar campus.

According to previous research, perceived risk plays as the essential role in M-Banking adoption. Chansaenroj and Techakittiroj (2015) stated that perceived risk and the factors that will affect M-Banking adoption is positively related. It is agreed by Yadav (2016) research as well. According to Chansaenroj and Techakittiroj (2015), although the customer perceived the risk of mobile banking services but still try to use it because they can still accept on some risk that maybe occur. Similar to Taleghani and Taleghani (2016), stated that perceived risk plays as the most important determinant for M-Banking adoption.

2.4.4 Relative Advantage

H_0: There is no significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

H_1: There is a significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.

Previous research found that relative advantage as the primary factor toward adoption intention of M-Banking (Mattila 2003; Akturan and Tezcan, 2012). According to Lin (2010), relative advantage and adoption of M-Banking service has a positive relationship. The result was consistent with Chitungo

and Munonggo (2013) which stated that relative advantage has influence on person's attitude, hence impact on the intention towards M-Banking. Relative advantage had been found related to the intention over mobile banking positively in Malaysia (Cheah et al., 2011). Numbers of research have demonstrated that relative advantage has a positive path toward the determinant of behavioral intention toward mobile banking (Lee, 2003; Khraim et al., 2011; Al-Jabri and Sohail, 2012; Makanyeza, 2017).

2.4.5 Trust

H_0: There is no significant relationship between trust and behavioral intention toward M- Banking among UTAR undergraduates in Kampar campus.

H_1: There is a significant relationship between trust and behavioral intention toward M- Banking among UTAR undergraduates in Kampar campus.

According to previous study, the independent variable, trust had a significant character in M-Banking adoption. As reported by Pamungkas and Kusuma (2017), they showed that trust is positively and significantly connected to mobile banking acceptance. It is agreed by Liu, Min and Ji (2009) research as well. Based on study of Hanafizade, Behboudi, Koshksaray, and Tabar (2014), they indicated that trust is an important antecedent in explaining the implementation of M-Banking. Similar to Chiu, Bool and Chiu's (2017) research showing non-adopters in mobile banking claimed that the initial trust history had an important effect on the behavioral purpose of using online banking services.

2.5 Conclusion

In a nutshell, relevant theoretical framework and past studies have been discussed. Hypothesis were developed and a conceptual framework was proposed in chapter two. The methodology will be deliberate in subsequent chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The study deliberates the analysis of methodology. Research layout, data collection and analysis will be engaged to give researchers a clear mind to carry out the research. In this study, data was analyzed by using Smart PLS 3.0.

3.1 Research Design

The connection between variables with the primary purpose being to research and constitute that relationship by using statistical analysis was investigated using quantitative research Result can be demonstrated in the form of graph, charts or table which shows a logical trend to the researchers by using quantitative research. Descriptive design was used to explain the current phenomenon of adoption of M-Banking among undergraduates in UTAR Kampar.

3.2 Data Collection Methods

3.2.1 Primary Data

The most popular collection techniques for primary data are the experiment and social surveys. In this study, social surveys were used to interview on sample based on large target population. Researchers will distribute numbers of standardized questions and responses are coded in answer categories. Researchers can conduct survey to collect data on observations, attitudes, feeling, experience and opinions of a population. By using survey research, researchers can obtain the subjective information and objective characteristics of a population. The limitations of surveys are sample size problem and the validity of the responses. Hence, interview questions must be planned, evaluated and approved to ensure valid responses (Hox & Boejie, 2005).

3.3 Sampling Design

3.3.1 Target Population

The person who take part in this study are referred as "participants" who targeted by researchers in generalizing conclusions. In this research, undergraduate students who study in UTAR Kampar are selected to be the target population in the research. The reason for selecting UTAR

undergraduates' students as respondents is because UTAR is Malaysia's biggest private university and students from 19 years old and above who have commonly use mobile phone in their daily life and they are person who can adopt a new technology and innovation easily. Moreover, they are potential users of M-Banking because every student in UTAR has a Public Bank account, they may perform their daily transaction by using M-Banking. Thus, through this research, banking industries and software development companies should know what the reasons for students are to adopt the usage of M-Banking in order to make improvement in their system

3.3.2 Sampling Frame and Sampling Location

Malhotra, Peterson and Uslay (2006) stated that sampling frame is sampling units that chosen by researchers that includes a set of instructions for identifying the target population in this study, researchers had targeted undergraduate students as respondent. This is because students who study in UTAR Kampar are mostly among ages 19 years old and above, due to the large population of youngsters who come from distinct locations across the country UTAR Kampar was selected as the sampling location. To gather opinion from different faculty Student Pavilion II (block K), Student Pavilion I (block C) and library of Kampar campus are the main places for researchers to distribute the survey.

3.3.3 Sampling Elements

The researchers had collected 384 survey forms in this research. Main target respondents of the study are UTAR Kampar undergraduate students who are the users of smartphone and M-Banking that ages are 19 years old and above. To examine factor that affecting the adoption of M-Banking in UTAR Kampar, all survey forms were responded by UTAR students.

3.3.4 Sampling Techniques

There are two types of sampling techniques which are probability sampling and non-probability sampling. The researchers choose to use non-probability sampling in the study. This is because non-probability sampling is a convenience and suitable to use in this study due to limitation on time, budget and large sample size. Etikan, Musa, and Alkassim (2016) stated that the main purpose of the convenience sampling is to collect information of respondents that can be access easily by the researchers. Hence, respondents were chosen on the spot at the correct place and the correct time

3.3.5 Sampling Size

Table 3.1: *Krejcie and Morgan's Determining Sample Size Table*

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note: N is population size; S is sample size.

Source: Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Etikan et al. (2016) said that sample is only one of the components in population chosen. The researchers can ensure the sampling size from the given target population by using the sample size table. Currently, there are 9595 students in UTAR (refer appendix 3.1). However, before distributed questionnaires, this study must set up the questionnaire and get a research permission letter (refer appendix 3.2) from Faculty of General Office (FGO).

3.4 Research Instrument

Survey questionnaire is the key tool of this research which questions related to the topic are presented. In specific, a fully self-administered questionnaire is being adopted in the study, which is developed by Levine, Simmons, Koris, Daltroy, Hohl, Fossel and Katz. (1993). Lack of interviewer-respondent interaction is the main element of the self-administered mode (De Jong, 2016). The respondent will be answering the questionnaire by themselves without the intervention of the interviewer or researchers.

3.4.1 Questionnaire Design

The survey questionnaire consists of two sections. The first section (Section A) is concerning the respondent's demographic information which included the gender, age, faculty of study and frequency of using M-Banking. Total of 30 questions regarding the dependent and independent variables is included in Section B for each set of questionnaires. Total of 5 questions is designed for the dependent variable, adoption of M-Banking while the remaining 25 questions were regarding the five independent variables which perceived usefulness are, perceived ease of use, perceived risk, relative advantage and trust (refer appendix 3.3).

3.4.2 Pilot Test

It is crucial and essential stage in preceding to run the major scale compilation of statistic in the research study by using pilot test (Zailinawati, Schattner & Mazza, 2006). 30 sets of pilot test survey questionnaires were distributed among the UTAR undergraduate students. According to the past studies, 10 to 30 participants are suggested for the pilot test in survey research (Isaac & Michael, 1995; Hill, 1998). While a general rule of thumb for pilot test which the ideal number of participants is 30 to 100 participants, while the number will be vary based on the survey sample size (Ruel, Wagner & Gillespie, 2015). It is a pre-test to detect potential problems in the proposed research (Alkhurayyif & Weir, 2017). Pilot test helps to enhance the relevance, clarity and content of the research. Also, signs of the connection between variables in the questionnaire will be discovered and the performance like time taken will be estimated. The data collected from the pilot test purposed questionnaire is inserted into Smart PLS 3.0 software to run the reliability. The questionnaire

will be amended if any problem being found based on the pilot test result and distribute to the larger sample for real study.

3.5 Construct Measurement (Scale and Operation Definitions)

The level of operation measurement is to explain the information of the values assigned to the variables (Bhat, 2019). There are 4 fundamental levels of variable measurement developed by Stanley Smith Stevens, namely nominal, ordinal, interval and ratio. This research study adopted nominal, interval (Likert scale) and ratio scales which is listed in the questionnaire. Also, the elements presented in the survey questionnaire were adopted from the past researches. To determine the statistical inference test, data gathering, and analysis will be done by the researchers.

3.5.1 Nominal Scale

Variables are usually been simply named or labeled in nominal scale. It is a naming scale termed as categorical variables. Nominal scale excludes of the quantitative value and has no order. The nominal scale is mutually exclusive and has no numerical significance. For example, gender which categorized into male and female. This research adopted nominal scale to ascertain the demographic profile of the students. According to the questionnaire, gender, age and faculty of study are measured in nominal scale for analysis.

3.5.2 Interval Scale

A numerical evaluation which the order of the variables shows differences between each of these variables. It represents the space in between which is the equidistant of two entities (Baht, 2019). This scale has no true zero value while it shows ordered and meaningful divisions. The common scales, Likert scale were adopted in the research. The typical five-levels Likert format used ranges from one to five which represented strongly disagree, disagree, neutral, agree, and strongly agree respectively. Likert scale is assigned in the Section B of the questionnaire to investigate the degree of agreement toward the statement. Source of questions for each variable refers to appendix 3.4.

3.6 Data Processing

384 sets of questionnaires were be collected from UTAR Kampar undergraduates' students and the data were collected and analyzed by using Smart PLS 3.0

3.6.1 Data Checking

Researchers will conduct data checking to assure the questionnaire is filled by the respondents. Data checking can help to identify whether the questionnaire is valid. The questionnaire will be invalid if it is entering incompletely or fill by an unqualified respondent. Quality of the collected data were guaranteed by making sure all the data were completed and entered accurately by the

respondents. Any error from the questionnaire will be removed.

3.6.2 Data Editing

Researchers can detect and amend the data error within the questionnaire through data editing. All the collected data need to be edited to safeguard the accurateness, completeness along with consistent of data and the inaccurate data sources can be avoided. Hence, data editing is an effective way to avoid inaccurate data that will delude the research outcome.

3.6.3 Data Coding

Researchers will categorize the data through theme in the questionnaire by using data coding. Each questions of the questionnaire are labelled with a code or number to retrieved data easily for further comparison and analysis (Gibbs, Clarke, Taylor, Silver & Lewins, 2015). For example, one to five which represented from strongly disagree to strongly agree respectively. After the collection of data, it will be translated into values, percentage or numerical quantities to make a conclusion.

3.7 Data Analysis

In this research, SMART PLS 3.0 are applied for data collection analysis. Descriptive analysis, Composite Reliability, Average Variance Extracted, Cronbach's Alpha,

Outer Loading Analysis, Heterotrait-Monotrait Ratio (HTMT), Variance Inflation Factors, bootstrapping and path coefficient were used for the data collected analysis. 400 questionnaires, which were collected from the UTAR undergraduate students

3.7.1 Descriptive Analysis

According to Vetter (2017), quantitative data is described, calculated, and summarized by descriptive analysis. Descriptive statistics are used to simplify numerous data in a sensible way and cut those data into more simple summaries. Mean, mode, median, interquartile range, coefficient of variance and standard deviation are included in descriptive analysis. By using Smart PLS, the data which obtained from the questionnaire in this research will be summarized in table and graph. The results will be discussed clearly in chapter 4 through the graph and the tables.

3.7.2 Partial Least Square- Structure Equation Modelling (PLS-SEM)

Partial least squares path modelling is one of the most general and well-developed system among all the variance-based SEM methods (Henseler, Hubona & Ray, 2016). Itis used to define the relationships of endogenous and exogenous variables. Furthermore, PLS- SEM is a preferred method for a small sample size model. The structural models for PLS-SEM are complex, and it will be used to estimate with a greater order construct that has only included two first- order constructs (Hair, Hollingsworth, Randolph & Chong, 2017).

3.7.2.1 Outer Loading Analysis

Memon and Rahman (2014) stated that the manifestation of outer loading overestimation through PLS-SEM are supported. Outer loading analysis is stated as a more traditional outcome for inner path model relationships compared to others. One of the reliability indicators is outer loading analysis. Convergent and discriminant validity, which use to test the validity of the variables, while the variance of individual manifest relative to latent variable are explained by individual manifest reliability by computed the standardized outer loadings of the variables. The researchers found that outer loading value with 0.7 and higher are stated as highly satisfactory. The manifest variables, which have the outer loading value of less than 0.5should be removed while the outer loading value that fall from 0.4 to 0.7 is regarded as acceptable.

3.7.2.2 Reliability Test

Reliability is defined as precision or the compatibility of measurement. It is used to indicate the measurement's consistency and stability and to obtain the 'goodness' of a measure. Reliability also explained the consistency of scores, which collected by the same test takers with the same test on two different period. The measure of reliability explained the extent to which the outcome is without any bias and ensures the measurement is consistency cross time and over the several particular in the instrument. Reliability concerned to the results, which collected with the assessment instrument instead of the instrument itself (Rosaroso, 2015).

3.7.2.2.1 Cronbach's Alpha

As reported by Sharma (2016), reliability does not rely on any validity of an instrument, it is implicated with the ability of an instrument to measure the consistency. Cronbach's alpha is applied for the internal consistency test on a measurement based on an item's average correlation or co-variances in a survey instrument or questionnaire. The coefficient of Cronbach's alpha reliability is generally ranging from zero to one. It is also mostly used in social and behavioral studies for an index of reliability (Wadkar, Singh, Chakravarty & Argade, 2016). The value of alpha is significantly relying on the correlation among the pairs of items in a survey and it will be affected by the length of the test. A high value of alpha with 0.95 does not point as high reliability (Sharma,2016).

Table 3.2: *Scale of Cronbach's Alpha*

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Sharma, B. (2016). A focus on reliability in developmental research through Cronbach's Alpha among medical, dental and paramedical professionals. *Asian Pacific Journal of Health Sciences, 3*(4), 271-278.

As shown in Table 3.2, the alpha's value less than 0.5 is defined as unacceptable while the alpha's value, which fall from 0.5 to 0.6 is considered as poor. Value of alpha fall from 0.6 to 0.7 is indicates questionable while the alpha's value from 0.7 to 0.8 is counted as acceptable. The range within 0.8 and 0.9 is stated as good while for the alpha which higher than 0.9 is stated as excellent.

3.7.2.2.2 Composite Reliability (CR)

Another measurement for internal consistency is composite reliability. Reliability play an important role in many past studies. Cronbach's alpha and composite reliability are applied to indicate how good of the variables that evaluates a single latent construct even though indicators have different burdens. Composite reliability is stated as a better measurement for internal consistency instead of Cronbach's alpha because CR use the standardized loadings of the revealed variables. However, there are no differences in interpreting the results. Memon and Rahman (2014) stated that the value of 0.7 is suggested as 'modest'. Based on the research of Henseler, Ringle and Sinkovics (2009), the result of composite reliability must not be lower than 0.6. The value of internal composite reliability above 0.8 or 0.9 in advanced stage of research and values of above 0.7 in earlier stages of research are stated as satisfactory. The reliability between the manifest variables and indicators can be measure with the value of 0.7 and higher, whereas the value of reliability which below 0.6 is indicated as lack of reliability.

3.7.2.2.3 Average Variance Extracted (AVE)

Convergent validity is tested by Average Variance Extracted (AVE). The manifest variable, which capture the variance amount from its relative latent variable due to error in measurement can be determined by using it (Memon & Rahman, 2014). Fornell and Larcker (1981) suggested that using the AVE to examine convergent validity. When the AVE result with value of 0.5 and above, it stated as adequate convergent validity. In other words, half and more of the variance of its indicator is capable to define by a latent variable on average. Chin (2010) also stated that the AVE value with 0.5 and above means 50% and higher of the indicator's variance can be considered as sufficient convergent.

3.7.2.3 Discriminant Validity

Hair Jr, Sarstedt, Ringle and Gudergan (2017) have stated the association between the latent variables can be measured by discriminant validity. It is crucial to avoid the problem of multicollinearity. In addition, the strongest relationship between the construct and indicator in the path model also can be proved by discriminant validity.

3.7.2.3.1 Heterotrait-Monotrait Ratio (HTMT)

The multicollinearity issue in the model had been examined by using HTMT method. Henseler, Ringle and Sarstedt (2015) suggested that former methods are incapable in detecting the insufficient of discriminant validity in common

research situation, hence, the researchers suggested another way based on the multitrait-multimethod validity to detect the insufficient of discriminant validity by using Heterotrait-Monotrait Ratio (HTMT). In the past study, Henseler et al. (2015) found that HTMT sensitivity and specificity rate is higher compare to Fornell-Larcker Criterion, which are 97% to 99% and 20.82% respectively. In the research of Ab Hamid et al. (2017), they stated that the discriminant validity is considered as low when HTMT value is nearby 1. However, some other authors, for example Kline (2011) suggested the discriminant validity considered as insufficient when the HTMT value is above 0.85. In addition, Gold, Malhotra and Segers (2001) stated that the requirement should be 0.90.

3.7.2.3.2 Variance Inflation Factor (VIF)

The level of multicollinearity between the independent variables is examine by using Variance Inflation Factor (VIF). When value of VIF is fall between 5 to 10, it demonstrates that that variables are highly correlated. It represents problematic in the model. In addition, if the value of VIF is more than 10, this means that the multicollinearity issue occurred in the model is serious. In the case of VIF is above 5, researchers were suggested to remove the variable from the model. Besides, when the VIF value is equal to 1, it can be concluded that there is no problem of multicollinearity. Moreover, if the value is greater than 1 and less than 5, it indicates that the variable is moderate correlated. (Akinwande, Dikko & Samson, 2015).

Table 3.3: *Scale of VIF*

Value of VIF	Interpretation
VIF>5	High correlated
1<VIF ≤ 5	Moderately correlated
VIF=1	Not correlated

Source: Daoud, J. I. (2017). Multicollinearity and Regression Analysis. *Journal of Physics: Conference Series.*

3.7.2.4 Bootstrapping

The statistic of unknown sampling distribution can be analyzed by using Bootstrapping which is a non-parametric resampling technique in studying a research, it can be used to investigate the significant of the variables. Bootstrapping can access the statistic's variability by estimating the sample data's variability rather than using the parametric assumptions to guess for the estimation. Furthermore, small sample size and non- normal data can be evaluated by the bootstrapping. By using the bootstrapping, variance, biases and confidence intervals for a complicated analytic circumstance will be able to identify (Streukens & Leroi-Werelds, 2016).

Wood (2005) stated that bootstrapping is important for researchers in their study for several points. Firstly, the usage of bootstrapping required only few general mathematics or probability theory. Secondly, bootstrapping had no restriction on the assumption of the statistic. This is because the real data may not meet the assumption, for example, normality. Lastly, bootstrapping can

apply in large sample size. This is because under some circumstances, when the common strategies face troublesome or difficulties, bootstrapping can provide a solution for it.

3.7.2.4.1 P-value

When performing a hypothesis test in statistics, the significance of variables was determined by using p-value. The null hypothesis is normally defining as a hypothesis of no difference between the variable. The significance level is a probability which is pre-chosen and the "P value" is the probability. Stats Direct (2018) state that when the p-value is greater than the level of significance, the null hypothesis will not be rejected.

3.7.2.4.2 Path Coefficient

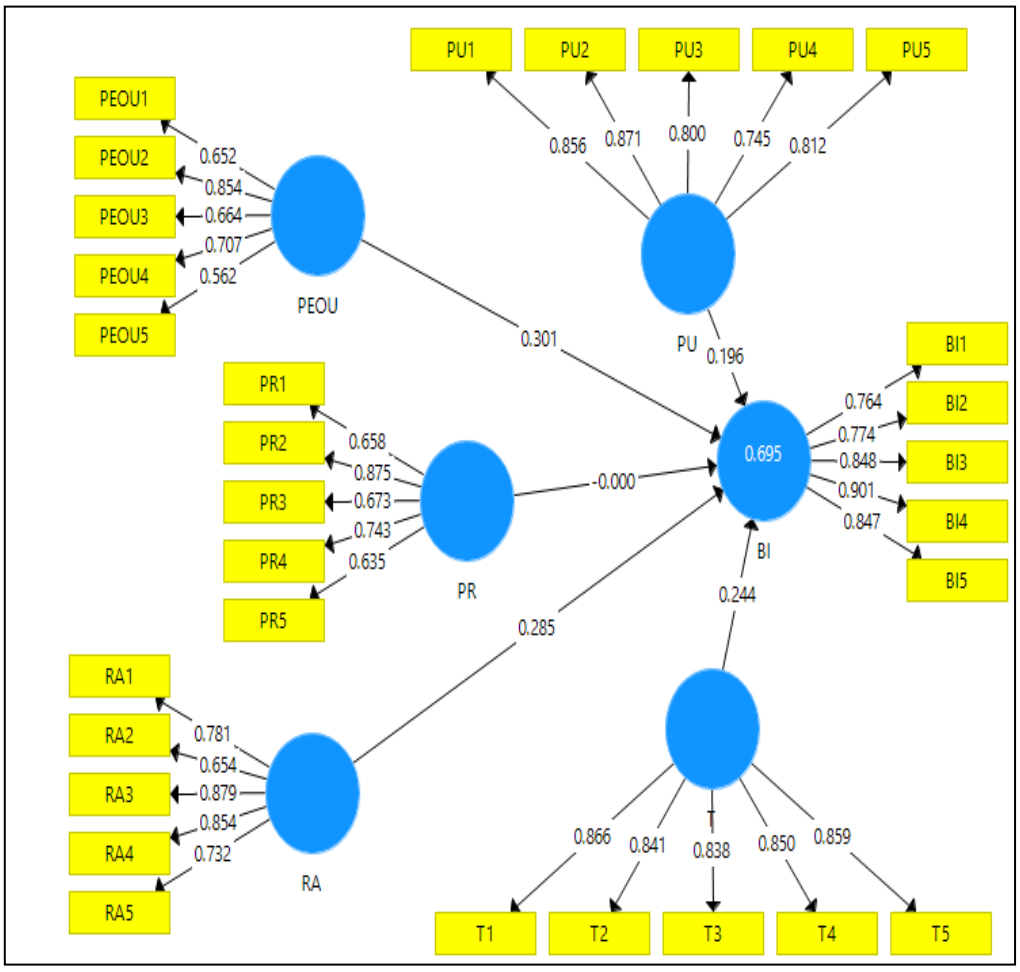
Path Coefficient is used to investigate the importance of association between variables in the SEM. It can affect the dependent variable when it is larger than other. Moreover, holding other variable constant, path coefficient of dependent variable will have impact when there is a unit change in the independent variable. When path coefficient is statistically significant; a causal connection will be pointed out from the dependent and independent variable. Furthermore, there is a standardized range for path coefficients, which falls between –1 and +1. The relationship between variables can be consider as strong positive relationship when the value of path coefficient is around +1. The statistic can be considered as significant. When the path coefficient is -1, it can be concluded that the variables are negative related.

While path coefficient is near to zero represents that there is no significant relationship between variable (Hair et al., 2017).

3.8 Pilot Test Results

3.8.1 Outer Loading Analysis

Figure 3.1: Diagram of Outer Loading Analysis



Source: Developed for the research

Table 3.4: *Outcome of Outer Loading Analysis*

	BI	PU	PEOU	PR	RA	T
BI1	0.764					
BI2	0.774					
BI3	0.848					
BI4	0.901					
BI5	0.847					
PU1		0.856				
PU2		0.871				
PU3		0.800				
PU4		0.745				
PU5		0.812				
PEOU1			0.652			
PEOU2			0.854			
PEOU3			0.664			
PEOU4			0.707			
PEOU5			0.562			
PR1				0.658		
PR2				0.875		
PR3				0.673		
PR4				0.743		
PR5				0.635		
RA1					0.781	
RA2					0.654	
RA3					0.879	
RA4					0.854	
RA5					0.732	
T1						0.866
T2						0.841
T3						0.838
T4						0.850
T5						0.859

Source: Developed for the research

A high outer loading which above 0.7 is recommended because the associated indicators were considered converged. The outer loadings which above 0.4 (Hair, Ringle & Sarstedt, 2011) or 0.5 (Afthanorhan, 2013) should be remained. However, when the value below 0.4, the indicator should be removed because it has less effect towards these factors. Most of the variables have fulfill the condition which above 0.7. However, PEOU1, PEOU3, PEOU5, PR1, PR3, PR5 and RA2 were less than the benchmark of 0.7 but exceed 0.4. Hence, all the variable can be remained.

3.8.2 Cronbach's Alpha (CA)

Table 3.5: *Outcome of CA*

Variables	Cronbach's Alpha
Behavioral Intention toward M-Banking	0.886
Perceived Usefulness	0.876
Perceived Ease of Use	0.731
Perceived Risk	0.782
Relative Advantage	0.840
Trust	0.906

Source: Developed for the research

When the Cronbach's alpha value increase, the value of the reliability will increase. 'Trust' is the highest among the variables with 0.906 and it is the most reliable indicator. While 'Perceived Ease of Use' and 'Perceived Risk' have the value of higher than 0.7 which are considered as acceptable internal

consistency. For other variables that above 0.8 are considered have good internal consistency.

3.8.3 Composite Reliability (CR)

Table 3.6: *Outcome of CR*

Variables	Composite Reliability
Behavioral Intention toward M-Banking	0.916
Perceived Usefulness	0.910
Perceived Ease of Use	0.820
Perceived Risk	0.843
Relative Advantage	0.888
Trust	0.929

Source: Developed for the research

The limitations of CA were overcome by the composite reliability to evaluate the reliability of the internal consistency. The variables are considered satisfactory and reliable if above 0.7. All the variables have the value of more than 0.7. In other word, the model is highly reliable in measuring the latent variable.

3.8.4 Average Variances Extracted (AVE)

Table 3.7: *Outcome of AVE*

Variables	Average Variances Extracted
Behavioral Intention toward M-Banking	0.687
Perceived Usefulness	0.669
Perceived Ease of Use	0.482
Perceived Risk	0.522
Relative Advantage	0.615
Trust	0.724

Source: Developed for the research

An AVE that above 0.5 means it can reduce the error variances by capturing more than 50% of the variances and indicates an enough convergent validity (Hair et.al, 2011). If the AVE is below 0.5 shows that the error variances is more than the variances that explained by the construct. However, to remain the AVE that above 0.4, the composite reliability must more than 0.6 as a requirement (Fornell & Larcker, 1981). All of the variables are above 0.5 except 'Perceived Ease of Use'. Nevertheless, it has the composite reliability of 0.820 which is above 0.6. Hence, the model has enough convergent validity.

3.9 Conclusion

Overall, the framework of the research methodology was well discussed in this chapter. Data analysis along with interpretation will be carried out in the subsequent chapter.

CHAPTER 4: DATA ANALYSIS

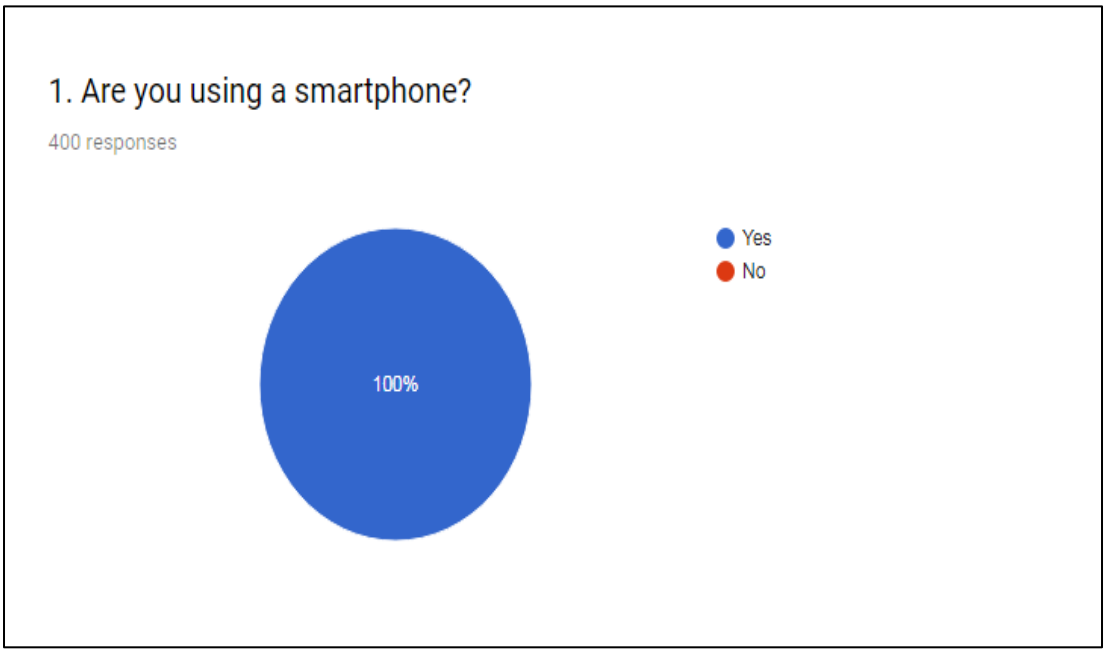
4.0 Introduction

384 questionnaires were collected from UTAR undergraduate students to carry out data analysis. The research will analyze the descriptive analysis of the respondent in terms of demographic profile. In the research, SMART PLS 3 was proposed to be used as analysis tool.

4.1 Filtering Question

Two questions related to mobile banking were designed at the first part of the questionnaire. Both questioned are obliged to be answered to proceed to the subsequent part of the questionnaire.

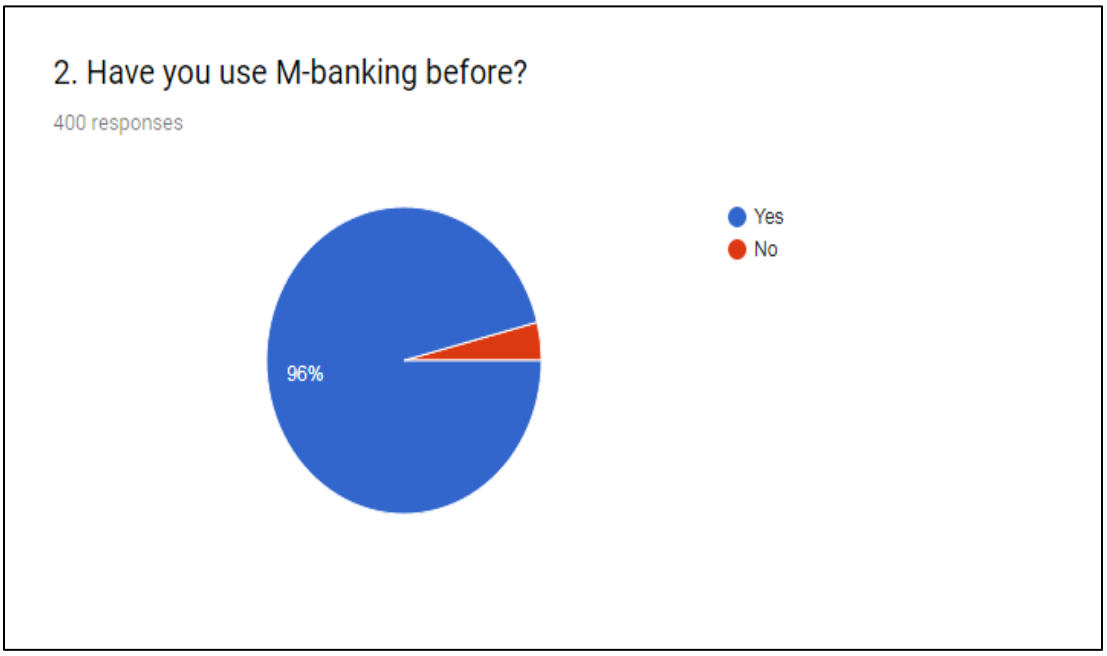
Figure 4.1: Responder Statistics



Source: Developed for the Research

384 sets of questionnaires were collected in UTAR Kampar for this research use. The question is to know if the respondents are using smartphone or not. The result shown all respondents were the smartphone user. Thus, the data collected is all respondents (100%) are using smartphone.

Figure 4.2: Data Filtration



Source: Developed for the Research

Respondents were questioned whether they have used M-Banking before in the second question. There are 16 of the respondents (4%) never used M-Banking before in the past. The invalid result has been withdrawn from the investigation since the research intention is to investigate the elements that influencing the adoption of M-banking. Hence, 384 set of questionnaires that have tried using M-banking in the past was being taken since it is reliable and aligns to the research objective.

4.2 Descriptive Analysis

Descriptive analysis portrays the specifications and general reactions of the respondents. It explains, illustrate and summarize data in a meaningful way. There are several questions being structured in the survey questionnaire regarding the respondents' demographic data.

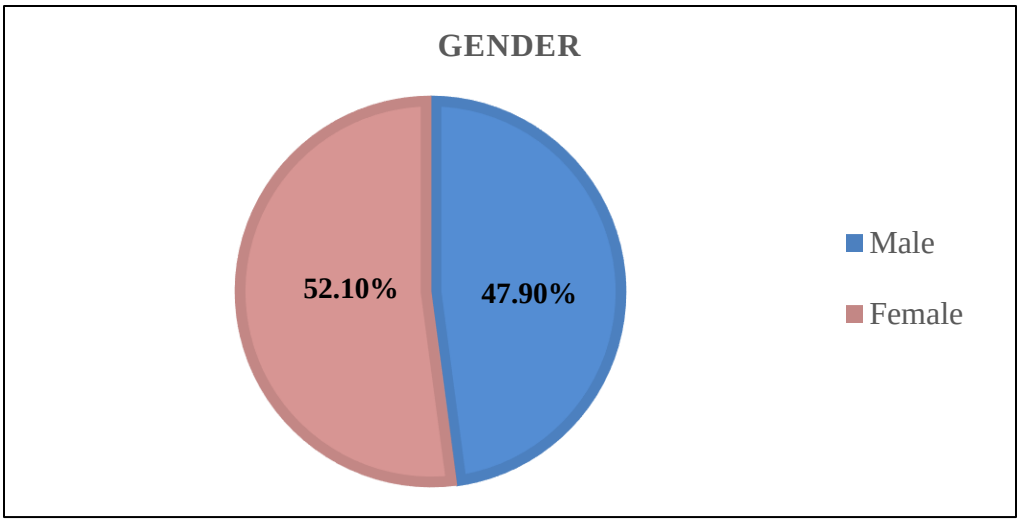
4.2.1 Gender

Table 4.1: *Gender*

Gender	Number	Percentage
Male	184	47.9%
Female	200	52.1%

Source: Developed for the Research

Figure 4.3: Gender



Source: Developed for the Research

The finding about the proportion of the respondents in gender was shown in table and figure above. The undergraduate students from the UTAR Kampar are the targeted respondents for this research. There are 184 male respondents and 200 female respondents being taken to further investigate for the research. There are 384 respondents in total who are validly related.

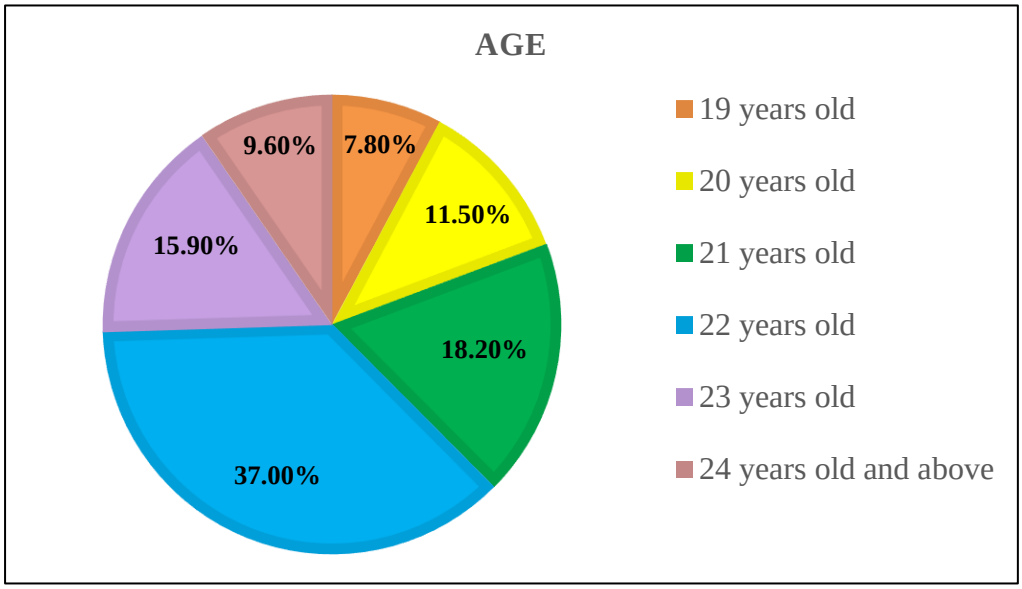
4.2.2 Age

Table 4.2: *Age*

Age	Number	Percentage
19	30	7.8%
20	44	11.5%
21	70	18.2%
22	142	37%
23	61	15.9%
24 above	37	9.6%

Source: Developed for the Research

Figure 4.4: Age



Source: Developed for the Research

The proportion for age of respondents represented in Table 4.2 and Figure 4.4. Among of the 6 levels of the age, 22 years old consists of the highest percentage of 37% for 142 numbers of respondents. Succeeded by the group of 21 years old which comprise of 70 respondents at 18.2% which is has the second highest percentage. Next, 61 respondents (15.9%) are from 23 years old. 20 years old demonstrates a total of 44 respondents (11.5%) while 24 years old and above demonstrates a sum of 37 respondents (9.6%). Age of respondents 19 years old exhibit subsist of 30 responders which yield the lowest percentage (7.8%).

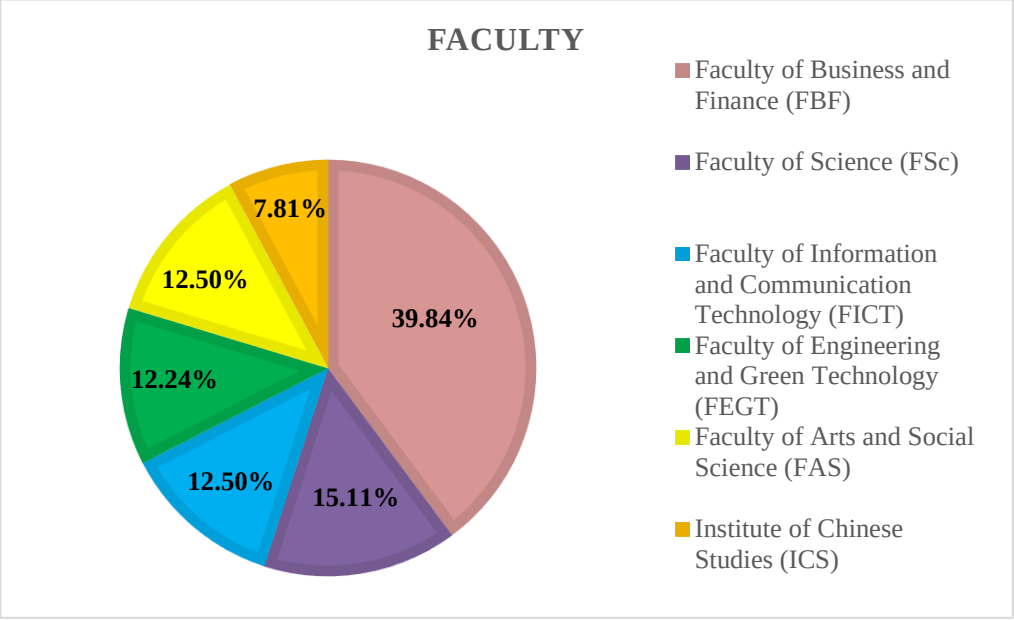
4.2.3 Faculty

Table 4.3: *Faculty*

Faculty	Number	Percentage
Business and Finance (FBF)	153	39.84%
Science (FSc)	58	15.11%
Information and Communication Technology (FICT)	48	12.50%
Engineering and Green Technology (FEGT)	47	12.24%
Arts and Social Science (FAS)	48	12.50%
Institute of Chinese Studies (ICS)	30	7.81%

Source: Developed for the Research

Figure 4.5: Faculty



Source: Developed for the Research

The findings show that most of the students are made up from the faculty of business and finance (FBF) which involve of 153 respondents (39.9%). The next highest frequency is from the faculty of science (FSc) which shows 58 respondents (15.11%). Faculty of information and communication technology (FICT) and faculty of arts and social science have the same amount of 48 respondents at 12.5%. Next, faculty of engineering and green technology (FEGT) consists of 47 respondents (12.24%). Institute of Chinese studies has the lowest percentage at 7.81% which made up of 30 respondents.

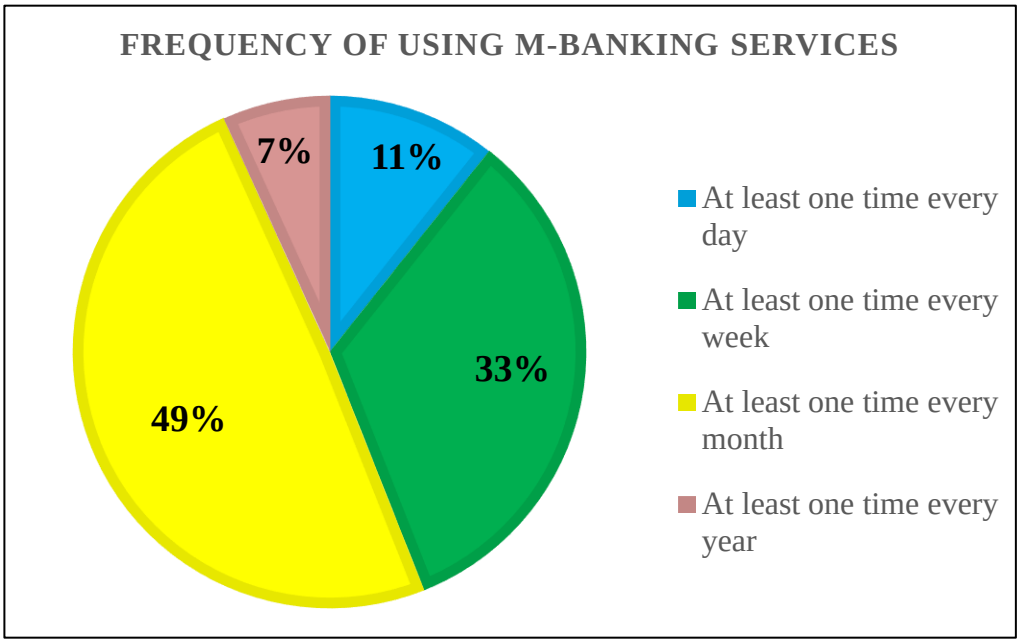
4.2.4 Frequency of using M-Banking services

Table 4.4: *Frequency of using M-Banking services*

Frequency	Number	Percentage
At least one time every day	41	10.68%
At least one time every week	128	33.33%
At least one time every month	189	49.22%
At least one time every year	26	6.77%

Source: Developed for the Research

Figure 4.6: Frequency of using M-Banking services



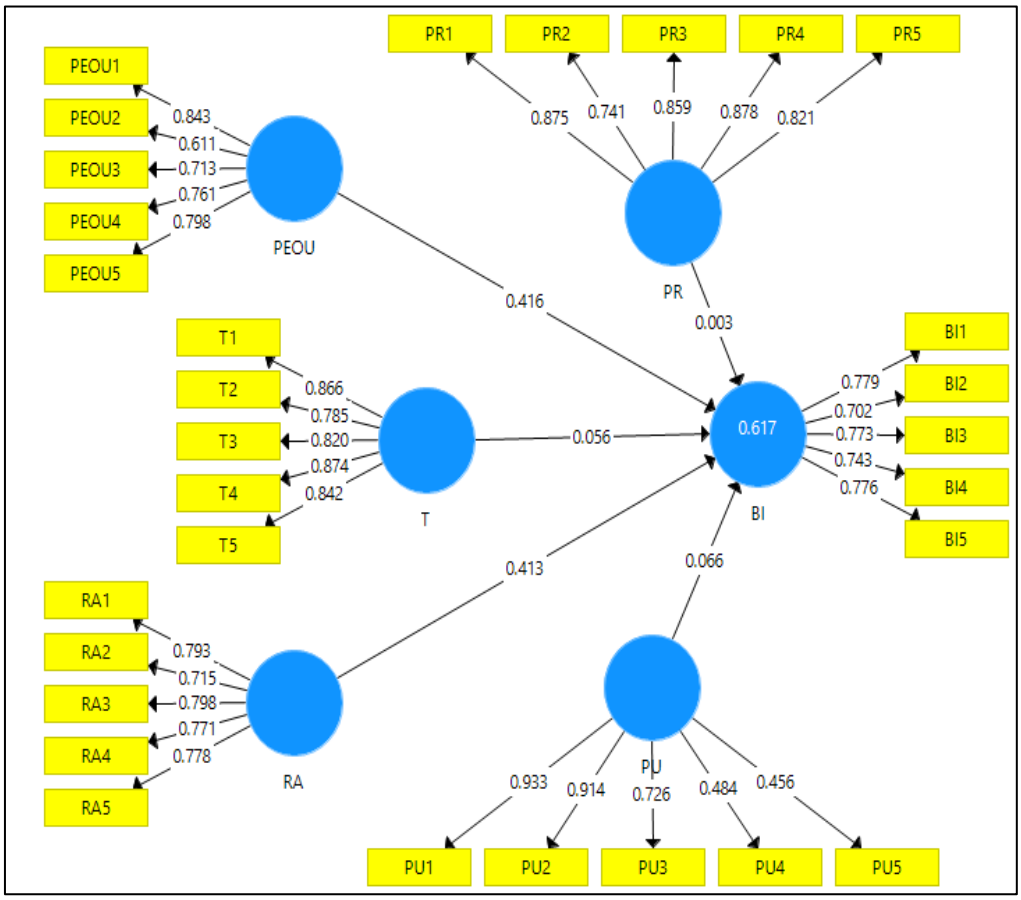
Source: Developed for the Research

The final outcomes for the frequency of using M-banking services illustrated in table and figure above. Regularity of at least one time every month has the highest percentage at 49.22% of 189 respondents. The second highest percentage is 33.33% from 128 respondents which represented at least one time every week. Next, the frequency of at least once a day demonstrates 41 respondents (10.68%). Frequency of at least one time every year has the lowest percentage which consist only 26 respondents (6.77%).

4.3 PLS-SEM

4.3.1 Outer Loading Analysis

Figure 4.7: Diagram of Outer Loading Analysis



Source: Developed for the Research

Note: BI is behavioral intention toward M-Banking; PU is perceived usefulness; PEOU is perceived ease of use; PR is perceived risk; RA is relative advantage; T is trust

Table 4.5: *Outcome of Outer Loadings Analysis*

	Behavioral Intention toward M-Banking	Perceived Usefulness	Perceived Ease of Use	Perceived Risk	Relative Advantage	Trust
BI1	0.779					
BI2	0.702					
BI3	0.773					
BI4	0.743					
BI5	0.776					
PU1		0.933				
PU2		0.914				
PU3		0.726				
PU4		0.484				
PU5		0.456				
PEOU1			0.843			
PEOU2			0.611			
PEOU3			0.713			
PEOU4			0.761			
PEOU5			0.798			
PR1				0.875		
PR2				0.741		
PR3				0.859		
PR4				0.878		
PR5				0.821		
RA1					0.793	
RA2					0.715	
RA3					0.798	
RA4					0.771	
RA5					0.778	
T1						0.866
T2						0.785
T3						0.820
T4						0.874
T5						0.842

Source: Developed for the Research

Note: BI is behavioral intention toward M-Banking; PU is perceived usefulness; PEOU is perceived ease of use; PR is perceived risk; RA is relative advantage; T is trust

According to the result, outer loading value for PU1 is considered highly satisfaction among all the variable, which means it contributes high reliability to the model with the value of 0.933. The outer loading value for the behavioral intention toward M-Banking is considered satisfied as the values are ranged from 0.7 to 0.9. For PU4 and PU5, it has the value of 0.484 and 0.456 respectively. Hair et al. (2011) have indicated the outer loadings which are more than 0.4 should be remained, conversely, less than 0.4 should be removed because it has less contribution to the model. Both the variables have achieved the minimum benchmark of 0.4, hence the variable can be remained.

4.3.2 Reliability Test

4.3.2.1. Cronbach's Alpha

Table 4.6: *Outcome of Cronbach's Alpha*

Variables	Cronbach's Alpha	No of item	Level of Reliability
Behavioral Intention toward M-Banking	0.811	5	Good
Perceived Usefulness	0.850	5	Good
Perceived Ease of Use	0.802	5	Good
Perceived Risk	0.907	5	Excellent
Relative Advantage	0.830	5	Good
Trust	0.894	5	Good

Source: Developed for the Research

The highest value among all the variables is perceived risk, which with result of 0.907. This showed that perceived risk is stated as the most reliable variable among all the variables. In addition, perceived usefulness with the value of 0.850, which fall between 0.8 and 0.9. Next, for the M-Banking adoption, perceived ease of use, relative advantages and trust, which with the value of 0.811, 0.802, 0.830 and 0.894 respectively. Hence, these four variables and perceived usefulness are fall under the same range of reliability, which indicated as good reliability level

4.3.2.2 Composite Reliability (CR)

Table 4.7: *Outcome of CR*

Variables	Composite Reliability
Behavioral Intention toward M-Banking	0.869
Perceived Usefulness	0.842
Perceived Ease of Use	0.864
Perceived Risk	0.921
Relative Advantage	0.880
Trust	0.922

Source: Developed for the Research

Variables of 'Trust" has the highest value with the result of 0.922. The result showed that trust is more reliable compare to other variables. In addition, perceived risk also showed the value of composite reliability with 0.921, which considered as satisfactory. Followed by relative advantages that indicated composite reliability value of 0.880, M-Banking adoption with the composite reliability value of 0.869 and for the perceived ease of use, which showed the value of 0.864. Even though perceived usefulness showed the lowest composite reliability result among all the variables, which with the value of 0.842, but it still able to achieve the satisfactory level for the composite reliability.

According to the composite reliability results, the total values of variables were above 0.7, which can fulfill the satisfactory level. This result indicated the reliability between indicators and manifest variables can be measured.

4.3.2.3 Average Variance Extracted (AVE)

Table 4.8: *Outcome of AVE*

Variables	Average Variance Extracted
Behavioral Intention toward M-Banking	0.570
Perceived Usefulness	0.535
Perceived Ease of Use	0.561
Perceived Risk	0.699
Relative Advantage	0.596
Trust	0.702

Source: Developed for the Research

The highest Average Variance Extracted (AVE) value among the all variables is trust, which with the result of 0.702. Whereas, 'perceived usefulness' with the lowest Average Variance Extracted result of 0.535 among all the variables, and it followed by the perceived ease of use, which value of Average Variance Extracted is 0.561, adoption of M-banking with 0.570 value of Average Variance Extracted and the value of relative advantage is 0.596. In addition, the Average Variance Extracted value of perceived risk is found to be 0.699.

According to the table 4.8, all the value is above 0.5, which fall between 0.535 and 0.702. These results indicated that convergent validity can study by using AVE in this research. Thus, these values can be stated that convergent validity is adequate.

4.3.3 Discriminant Validity

4.3.3.1 Heterotrait-Monotrait Ratio (HTMT)

Table 4.9: *Outcome of HTMT*

	Behavioral Intention toward M-Banking	Perceived Ease of Use	Perceived Risk	Perceived Usefulness	Relative Advantage
Behavioral Intention toward M-Banking					
Perceived Ease of Use	0.874				
Perceived Risk	0.107	0.104			
Perceived Usefulness	0.085	0.051	0.055		
Relative Advantage	0.866	0.81	0.096	0.048	
Trust	0.418	0.404	0.469	0.062	0.436

Source: Developed for the Research

Henseler, Ringle and Sartedt (2015) indicated that HTMT is stronger to detect the lack of discriminant validity compared to previous methods. Kline (2011) suggested that discriminant validity will be considered as insufficient when the value of HTMT is greater than 0.85, but the value of HTMT that below 0.90 is acceptable (Gold, Malhotra & Segers, 2001)

According to the result above, all the results are below 0.95, this means that the model can be consider as well-fitting. Besides, most of the results had pass the requirement of value of HTMT which are less than 0.85 except for the value of perceive ease of use and relative advantage which is 0.874 and 0.866 respectively. However, these values are still below 0.9, hence, the discriminant validity can consider as sufficient.

4.3.3.2 Variance Inflation Factors (VIF)

Table 4.10 *Outcome of VIF*

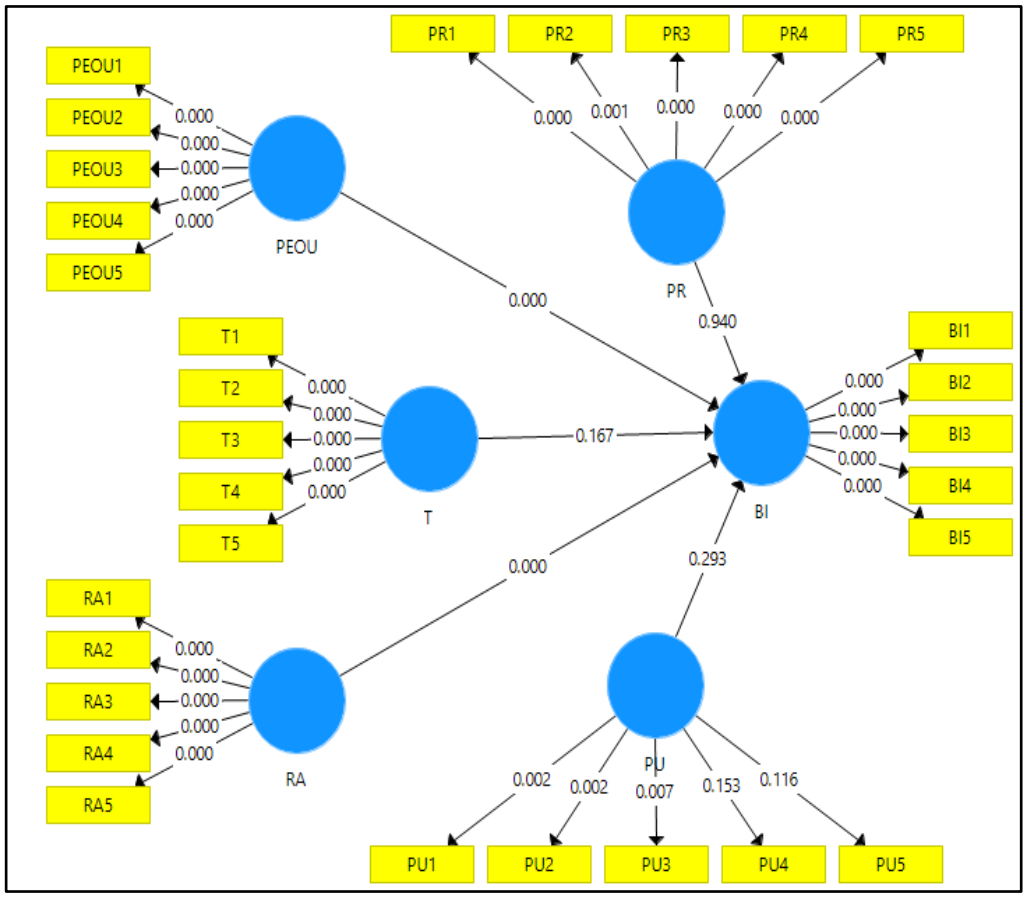
Variables	VIF
Perceived Usefulness	1.002
Perceived Ease of Use	1.823
Perceived Risk	1.257
Relative Advantage	1.883
Trust	1.483

Source: Developed for the Research

All the value of VIF are greater than 1 but lower than 5, this can be concluded that the variables are not highly correlated and the model is not problematic and no variable is need to be taken off.

4.3.4 Bootstrapping

Figure 4.8: Diagram of Bootstrapping



Source: Developed for the Research

Note: BI is behavioral intention toward M-Banking; PU is perceived usefulness; PEOU is perceived ease of use; PR is perceived risk; RA is relative advantage; T is trust

4.3.4.1 P-value

Table 4.11: *Outcome of Bootstrapping*

Variables	P-Values	Outcome
Perceived Usefulness	0.293	Not Significant
Perceived Ease of Use	0.000	Significant
Perceived Risk	0.940	Not Significant
Relative Advantage	0.000	Significant
Trust	0.167	Not Significant

Source: Developed for the Research

Assume that level of significant in p-value is 0.05. The table shows PEOU and RA have result of 0. 000 which are less than 0.05. It means both variables have relationships between the dependent variable which can be determined as significantly affecting the M-Banking adoption. Contrarily, p-value of the PR, PU and T are higher that significant level which are 0.940, 0.293 and 0.167, larger than 0.05. These findings indicated that the connection of perceived risk, perceived usefulness and trust toward the adoption are not significant.

.

4.3.4.2 Path Coefficient

Table 4.12: *Outcome of Path Coefficients*

Variables	Original Sample (O)
Perceived Usefulness	0.066
Perceived Ease of Use	0.416
Perceived Risk	0.003
Relative Advantage	0.413
Trust	0.056

Source: Developed for the Research

The path coefficient for each variable is illustrated in Table 4.12. All the variable was found to have a positive value which means that dependent variables will be changed in the unit if there is one unit increase in the independent variables. The variables will have a greater effect toward the dependent variable in the event that the path coefficient's value exceed another variable. From the findings, the PEOU has a larger impact on the BI, which means that BI will rise by 0.416 units if PEOU rise by a unit. While, BI will rise by 0.003 units when there is one unit rise in PR, PR has the least impact towards the BI.

4.4 Conclusion

The association between dependent variable and independent variable was investigated by using data analysis. Descriptive analysis, reliability test, discriminant validity and bootstrapping have been used as main indicators for the data analysis. The finding of the result will be presented in subsequent chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

Result of finding include descriptive analysis, reliability analysis, discriminant analysis along with bootstrapping will be presented. In addition, implication of study beneficial to financial institution, future researchers and software engineers, limitation and recommendation of study will be proposed as well.

5.1 Summary of Statistical Analysis

5.1.1 Descriptive Analysis

400 sets of surveys are handed out among the undergraduate students in UTAR Kampar. After filtering out the respondents who never used mobile banking before, data of 384 questionnaires were being adopted in the research. There are 52.1% of female respondents and 47.9% of male respondents in total for the 384 respondents. The respondents are further being classified into different age group which are 7.8% of the 19 years old, 11.5% of the 20 years

old, 18.2% of the 21 years old, 37% of the 22 years old, 15.9% of the 23 years old and 9.6% of above 24 years old respectively. 22 years old age group consists of the largest percentage among all which is 37% or 142 number of respondents.

Undergraduate students in UTAR Kampar were from many different faculties which including the Faculty of Business and Finance (FBF), Science (FSc), Information and Communication Technology (FICT), Engineering and Green Technology (FEGT), Arts and Social Science (FAS) and Institute of Chinese Studies (ICS). In the research, most of the data were obtained from FBF following by FSc which are 39.84% and 15.11%. Both FICT and FAS have the same apportion of 12.5%. While FEGT has 12.24% and 7.81% for ICS which is the least among all faculty. The usage of the respondents was being concerned and the frequency of using M-Banking services were ranged into four levels which are each time a day, a week, a month and a year. Majority of the students used the M-Banking for at least one time every month at 49.22%. Secondly, 33.33% of the respondents use it at least one time every week. 10.68% of the respondents' frequency is at least once every day while 6.77% of the respondents use at least one time every year.

5.1.2 Reliability Analysis

Composite Reliability, Average Variance Extracted (AVE) and Cronbach's Alpha had been applied to test the variable's reliability in the research model. Average Variance Extracted (AVE) and Composite Reliability test showed that the trust had the value of 0.922 and 0.702, which is the highest value among the among variable. Next, followed by the Perceived Risk, which with the result of composite reliability of 0.921 and value of AVE with 0.699.

However, perceived risk indicated the result of 0.907 in Cronbach's Alpha, which stated as the highest value and it come after Trust, with the value of 0.894. This outcome also showed that 'Trust' is the most reliable variable compares to the different variables in this research. Nevertheless, the variable of Perceived Usefulness showed the value of Composite Reliability with 0.842 AVE value of 0.535, which are the lowest compare to other variables and adoption of M-Banking outcome as well with value of 0.869 and 0.570. Furthermore, the Cronbach's Alpha value of Perceived Ease of Use with 0.802, are also the lowest test value among all the independent variables. In addition, it is also lower than the result of adoption M-Banking with result of 0.811. According to the outcome of Cronbach's Alpha, the variables has the value from 0.7 to 0.9, which greater than the minimum requirement. This result means all of the variables achieved a good reliability standard and the variables are able to fulfill the benchmark of Cronbach's Alpha test based on the average correlation or co-variances in a survey instrument. Also, for the composite reliability test, the value of all variables with value of 0.8 and above were completely fulfilled the satisfactory level, which required to be more than 0.7. For Average Variance Extracted (AVE) aspect, all variables indicated with value that greater than 0.5 which can be explained as all the variable is capable to explain 50% and above of the variance of its indicator on average.

5.1.3 Discriminant Validity

Heterotrait-Monotrait Ratio (HTMT) test and Variance Inflation Factor (VIF) test were carried out to test whether there is multicollinearity problem occur in the model. Firstly, in HTMT test, all the values of HTMT are below 0.95, this means that the model can be considered as well-fitting. Besides, most of the results had pass the minimum requirement of value of HTMT which is lower than 0.85 except for the VIF value of perceived ease of use and relative advantage which are 0.874 and 0.866 respectively. Kline (2011) stated that the discriminant validity is inadequate when the value is more than 0.85, but, the HTMT value that below 0.90 is acceptable (Gold et al, 2011).

Secondly, in the Variance Inflation Factor (VIF) test had carried to further make sure that multicollinearity issue does not occurred in this study. All the VIF value are greater than 1 but lower than 5, this can be consider that the variables are not highly correlated and the model is not problematic and no variable is need to be taken off.

5.1.4 Bootstrapping

The information will be bootstrapped after all the possible econometric issues are eliminating. The level of significant level is assuming to be 0.05 in p-value approach. According to the findings, most of the independent variables and dependent variable are found to have an insignificant connection. Since the p-value of PR (0.940), PU (0.293) and T (0.167) are not lesser than 0.05 hence there is insignificant connection exists between the usage of M-Banking. However, the independent variables of PEOU and RA are found significantly

affecting the dependent variable since both of the p-value are 0.000 which are not more than 0.05 that means they will have a significant effect on the M-Banking adoption. While the entire independent variable was discovered to have a positive value in path coefficient analysis, which means that those variables are showing positive association towards the dependent variable and the dependent variables will be changed in the unit if there is one unit rise in the independent variables. For examples, the PEOU is having the largest impact on BI, that means one unit rise in PEOU will cause rise of 0.416 units in BI. While, RA (0.413), PU (0.066), T (0.056) and followed by PR (0.003) are having smaller effect towards the adoption of M-Banking.

5.2 Discussion of Major Findings

5.2.1 Perceived Usefulness

Table 5.1: *Variables Result – Perceived Usefulness*

Independent variables	Hypothesis	Do not reject H_0
Perceived Usefulness	H_0: There is no significant relationship between perceived usefulness and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.	α: 0.05 P-value = 0.293 (>0.05) There is no significant relationship.

Table 5.2: *Past Studies Outline – Perceived Usefulness*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Usefulness	Mortimer, Neale, Hasan and Dunphy (2015), Zhang, Lu and Kizildag (2018), Daud, Kassim, Said and Noor (2011), Amin et al (2008)	-	AI-Jabri (2015)

Do not rejected the H_0 for perceived usefulness since the significant level of 0.05 is less than p-value (0.293). This can be considered that the association between perceived usefulness and the adoption of M-Banking is insignificant. In the other words, perceived usefulness may not affect the behavior intention of customers to utilize M-Banking. This outcome was supported by Al-Jabri (2015). A research model had been developed and examined in this study to investigate the factor that will affect the intention of consumers from Saudi Arabia M-Banking services. Paper-based survey had been performed and Partial Lease Square (PLS) had utilized to test the model. This result of this research concluded that the perceived usefulness did not has significant effect towards M-Banking adoption because the respondents may unable to express their perception toward M-Banking services accurately and evaluating the usefulness of mobile banking is difficult. However, this result did not agree by Mortimer, Neale, Hasan and Dunphy (2015), Zhang, Lu and Kizildag (2018), and Daud, Kassim, Said and Noor (2011) These past studies had concluded

that the relationship between perceived usefulness and the adoption of M-Banking is significantly related. However, these studies were targeted to the consumers from different countries; thus, some of the finding are not applicable to Saudi Arabia and Malaysia due to different cultures, attitudes and unique traits. Furthermore, undergraduate students of UTAR Kampar are the main target respondents of this study and most of the respondents do not feel that perceived usefulness is affecting their intention to adopt M-Banking. In addition, Amin et al (2008) had concluded that perceived usefulness is major factor that influencing behavioral intention of consumers toward M-Banking in Malaysia. However, the perception and behavioral intention of the consumer may change time to time; hence, the findings that obtained over 10 years ago may not applicable in the current research.

5.2.2 Perceived Ease of Use

Table 5.3: *Variables Result- Perceived Ease of Use*

Independent variables	Hypothesis	Reject H_0
Perceived Ease of Use	H_0: There is no significant relationship between perceived ease of use and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.	α: 0.05 P-value = 0.000 (<0.05) There is a significant relationship.

Table 5.4: *Past Studies Outline – Perceived Ease of Use*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Ease of Use	Hanudin, Baba and Muhammad (2007), Hanafizadeh et al. (2014), Alalwan et al. (2016)	-	Makanyeza (2017), Govender and Sihlali (2014)

H_0 for perceived ease of use is rejected with alpha 0.05 more than p-value (0.000). In other words, perceived ease of use has an association with behavioral intention toward M-Banking which can be interpreted as client's motivation to utilize M-Banking will be affected by perceived ease of use. It was supported by Alalwan et al. (2016), Hanudin, Baba and Muhammad (2007) as well as Hanafizadeh et.al (2014) which the research was carried out at Jordanian, Malaysia and Iran respectively which signify that behavioral intention toward M-Banking is impacted by perceived ease of use. Alalwan et al. (2016) have stated the perceived ease of use is crucial as customers must perform the transaction without any helping hand. Besides, the country investigated was Jordanians and Iranian which are foreign country which was vary from Malaysia in terms of perception and culture. For past studies in Malaysia (Amin et al., 2015), customer preferences might change as technology drive the world nowadays. Moreover, the respondent targeted in this research was undergraduate students and they are easier to adopt new technology. Hence, perceived ease of use is the primary consideration for them to adopt new technology. However, the result was contradicted with the finding of Makanyeza (2017) and Govender and Sihlali (2014). Based on the

past studies, perceived ease of use crucially not impacted the behavioral intention of users to utilize M-Banking. Makanyeza (2017) has stated that perceived ease of use has different setting in the middle of market, countries and time that are investigated. Nowadays, millennials are more aware and easier to adopt new technology. They can use, apply and understand new technology quickly regardless of the difficulties. Hence, easeful of the M-Banking is not the primary consideration for them to utilize the M-Banking services.

5.2.3 Perceived Risk

Table 5.5: *Variables Result- Perceived Risk*

Independent variables	Hypothesis	Do not reject H_0
Perceived Risk	H_0: There is no significant relationship between perceived risk and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.	α: 0.05 P-value = 0.940 (>0.05) There is no significant relationship.

Table 5.6: *Past Studies Outline - Perceived Risk*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Perceived Risk	Chansaenroj and Techakittiroj (2015), Yadav (2016)	Abadi, Kabiry and Forghani (2013), Taleghani and Taleghani (2016)	Priya, Gandhi and Shaikh (2018), Leiva, Climent and Cabanillas (2017)

Do not reject the H_0 for perceived risk because the alpha 0.05 is less than p-value (0.940). The outcome showed perceived risk and behavioral intention toward M-Banking are insignificantly related. In other words, the perceived risk of M-banking will not influence the customer' behavior intention on M-Banking adoption. This result is agreed by Priya, Gandhi & Shaikh (2018) and Leiva, Climent & Cabanillas (2017). Similarly, Priya, Gandhi & Shaikh (2018) studied the factors which will influence young Indian consumer to adopt M-banking while Leiva, Climent & Cabanillas (2017) also studied the factor that affect M-Banking adoption. Priya, Gandhi & Shaikh (2018) found that perceived risk is insignificant elements from perception of consumers because M-banking consumers do not seem to trust on any significant risk with M-banking adoption for conducting bank transactions. Leiva, Climent & Cabanillas (2017) also stated that perceived risk and behavioral intention toward M-Banking is insignificantly related because consumers can improve the intention of use by the user experience, and it can perceive by the consumers as a technology, which with a low risk exposure but without being the main factors in its adoption. Hence, perceived risk of M-banking does not

play an important role on affecting consumers to adopt M-banking. However, this result was contradicted with the result of Chansaenroj & Techakittiroj (2015), Yadav (2016), Abadi, Kabiry & Forghani (2013) and Taleghani & Taleghani (2016). All the previous research indicated that perceived risk and the M-Banking adoption is significantly related. The result was contradicted with the previous research may because of these studies were focused on foreign countries. This means that the previous finding may not able to apply to Malaysia because of different cultures, attitudes and unique traits. Furthermore, this research was targeted in UTAR undergraduate students, which studied in Kampar Campus, and most of them agreed on perceived risk is not the main element to affect their intention on M-Banking adoption.

5.2.4 Relative Advantage

Table 5.7: *Variables Result – Relative Advantage*

Independent variables	Hypothesis	Reject H_0
Relative Advantage	H_0: There is no significant relationship between relative advantage and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.	α: 0.05 P-value = 0.000 (<0.05) There is a significant relationship.

Table 5.8: *Past Studies Outline – Relative Advantage*

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Relative Advantage	Lee et al. (2003), Cheah et al. (2011), Khraim et al. (2011), Akturan and Tezcan (2012), Al-Jabri and Sohail (2012), Lin (2010), Püschel et al. (2010), Makanyeza (2017)	-	-

H_0 is rejected given that the level of significance for relative advantage (0.000) is not greater than 0.05. The P-value, 0.000 shows significant and positive connection between relative advantage and the M-banking adoption. The use of the M-banking increases as the relative advantage is greater, conversely. The result is backed by past studies (Lee et al., 2003; Cheah et al., 2011; Karaim et al., 2011; Akturan & Tezcan, 2012; Al-Jabri & Sohail, 2012; Lim, 2010; Püschel et al., 2010; Makanyeza, 2017). The better using experience of a banking or any other new technology as compared to its precursor is known as relative advantage. The better or the positive movement and effect as compared to the precursor, the higher intention to accept the innovation (Shaikh & Karjaluoto, 2015). Precursor like tradition banking methods which including the off-line banking and machines is less effective and convenient as mobile banking (Cheah et al., 2011). The likelihood adoption of mobile banking would be greater as the users realized the

probability to gain more relative advantage is higher (Cheah et al., 2011). For instance, the convenience and time saving. Corresponding to the research done by Tanakinjal, Deans and Gray (2010), relative advantage has the strongest influence in building consumer intention decision on adopting new technology or innovation. The intention toward mobile banking is affected positively on an individual behavioral intention (Makanyeza, 2017). Many past researches have stated out there is significant positive effect towards relative advantage on the M-Banking intention which also known as an identified merit (Chitungo & Munongo, 2013).

5.25 Trust

Table 5.9: *Variables Result – Trust*

Independent variables	Hypothesis	Do not reject H_0
Trust	H_0: There is no significant relationship between trust and behavioral intention toward M-Banking among UTAR undergraduates in Kampar campus.	α: 0.05 P-value= 0.167 There is no significant relationship.

Table 5.10: Past Studies Outline – Trust

Independent Variable	Past Studies		
	Significant		Insignificant
	Positive	Negative	
Trust	Pamungkas and Kusuma (2017), Liu, Min and Ji (2009), Chiu, Bool and Chiu (2017), Hanafizade, Behboudi, Koshksaray, and Tabar (2014)	-	Singh and Srivastava (2018), Koeing-Lewis, Palmer and Moll (2010)

H_0 for trust is accepted since the alpha 0.05 is less than p-value (0.167). According to the study, there is an insignificant connection between trust and adoption of M-Banking. In other words, trust will not influence the behavior intention of customers in M-Banking adoption. This outcome was endorsed by Koeing-Lewis, Palmer and Moll (2010) and Singh and Srivastava (2018). Similarly, Singh and Srivastava (2018) studied elements influencing M-Banking adoption in India, while Koeing-Lewis, Palmer and Moll (2010) studied barriers for mobile banking adopting. Singh and Srivastava (2018) stated that trust is an insignificant element to influence M-Banking adoption because clients consider financial institutions are the most reliable organizations. Lewis, Koeing-Palmer and Moll (2010) stated that trust is insignificant with behavioral intention toward M-Banking because clients have difficulty in assessing the safety or privacy of an internet site, although most participants were concerned that M-Banking could result in violations of their privacy by disclosing their private data. Hence, for customers to adopt

M-Banking, trust is not a main factor.

However, Pamungkas and Kusuma (2017), Liu, Min and Ji (2009), Chiu, Bool and Chiu (2017) and Hanafizade, Behboudi, Koshksaray, and Tabar (2014) did not agree with the findings. Most of the past researches found trust were significantly affecting the behavior intention of customers in M-Banking adoption. Foreign countries were the main target location for those studies, so some of their findings are not suitable to apply in Malaysia due to different cultures, attitudes and unique traits. Furthermore, UTAR Kampar undergraduate students are the main target participants in the research and most of them think that trust is not an important factor affecting their desire to adopt M-Banking.

5.3 Implication of Study

The factors that will contribute to behavioral intention toward M-Banking will be highlighted which are perceived ease of use and relative advantage. Some implication may be suggested to financial institutions, software engineers and future researchers for future study regarding to this topic.

5.3.1 Financial Institutions

Regarding to this research, there are several parties would be benefited from this research. Firstly, the financial institutions can be benefited which they are the main providers of M-Banking in Malaysia. They can adopt the significant factors such as perceived ease of use as well as relative advantage in providing the services. Customer will find the application is easy to use which will enhance their intention to adopt the services. Hence, financial institutions may introduce more services such as customer can access their account balance, account history and transaction in 24 hours basis and secure their mobile check deposit by using the smartphone camera. In this study, the result has shown that for customer to adopt M-Banking, there must be some advantage in return. Financial institutions may strengthen the advantage of using M-Banking to increase the adoption of the customers.

5.3.2 Future Researchers

Future researchers who are willing to discover in M-Banking could be benefited from this research. The research has stated perceived ease of use, relative advantage, perceived usefulness, perceived risk and trust were used as factors to impact the behavioral intention of users toward M-Banking services. However, perceived ease of use and relative advantage have demonstrated significant association only. Future researchers may take our variables as benchmark to either remove irrelevant variables or add in new variables to study the adoption of M-Banking. Besides, future researchers can take our research as guideline for future investigation because there is little research have been done in Malaysia.

5.3.3 Software Engineers

The result of study has benefited the software engineers which can assist them to contribute a vital vision for them to develop and carry out M-Banking services which can increase the adoption of the services. They can adopt the significant elements such as perceived ease of use together with relative advantage to create an efficient mobile banking application for end users. They may create a web design that are user friendly for users, users may perceive the application is easy to use and increase their intention to adopt it. Besides, software engineers may improve the mode of payment which prioritize the speed and convenience of using M-Banking which will benefit the end users.

5.4 Limitation of Study

Several constraints were found in the research. Future research should consider these limitations to improve their research. First of all, this study's empirical evidence is collected from UTAR undergraduate students, which their age is fall between the age range of nineteen to twenty-four years old. The results that indicated from this study can only represent the opinion and intention of most of the 90's generation but not for the public point of view. M-Banking not only target on young generation consumers, but also consumers of different age range. Consumers with different age will have different view and perspective. Hence, the acceptance or opinion of M-Banking of these consumers and may different with the opinions of sample respondents. Generation Z is the first generation who truly growing up with technology, which mean that they might be more curious and willing to try new technologies compared to other generations. On the other hand, Generation X and Baby Boomers (BB) may

need to take more times to follow up the changes of technologies. Young generation can be more easily to catch up with the new technologies while for the elderly, it is a huge challenge for them. Therefore, the reliability and accuracy results may be affected by these reasons.

Furthermore, the results are collected from the randomly distributed questionnaires to UTAR undergraduate students at the same period with the period of study being conducted. Perception and intention of an individual to adopt M-Banking will changes from time to time. In other words, individuals' perception can be determined through their past opinions, experiences, values and beliefs. Thus, the acceptance level of M-Banking and the elements that affect use of M-Banking may also be change over the time. However, these results of study can only represent the opinion and motivation to adopt M-Banking of the 90s' generation. This is because opinion and motivation to adopt M-Banking may changes across the time, so they may have different opinions and views on M-Banking based on their new experience and the technologies improvement. Hence, these may cause the result to become less accuracy.

Moreover, the questionnaires of the research were hand out randomly to the UTAR undergraduate students in Kampar campus who are from several faculties. The respondent of the questionnaires has different education background, in other words, this means they may have different opinion towards Mobile banking. Hence, it may influence the accuracy and reliability to the result.

Also, only undergraduate students of UTAR Kampar are targeted in this study. However, the potential user of Mobile banking might from different educational level such as secondary school education, diploma, master, PHD etc. The people from different educational level might have different view towards M-Banking, hence, the elements that affecting their use of M-Banking and the acceptance level may also

different. Therefore, the results obtained in this study may not capable to stand for the opinions of all consumers in Malaysia; hence, accuracy of the results will become lesser because of these limitations in this study.

5.5 Recommendation of Study

Research had discovered some constraints throughout the process. Thus, there are some recommendation for this study that future academics can refer to in order to enhance the constraints. Firstly, researchers are urged to widen the age and generation of the target participants in future research. The target respondents ' age range may be wider by including more distinct generations such as generation Z, working children and postwar generation. Individuals from different generations have grown in distinct historical context which could influence their perspective and exposure to M-Banking-related technology. Thus, there may be some variations in the rate of acceptance among distinct generations of individuals.

Secondly, it is suggested that comparisons should be made between distinct fields of study for students that are majoring in different courses towards adoption of M-banking. People from different education background may have different opinion on Mobile banking. For instance, people studies science, social science, economics, information technology and finance as their major of studies will have different views towards an innovation like M-Banking. Hence, future researches are advised to research more on this aspect to improve the results and factors that give impact to the implementation of M-Banking.

Lastly, to overcome the limitation on the level of education of target participants, the sample should include distinct levels of education of participants. In future studies,

the researchers can include not only undergraduate's students as their respondents but include also those from different level of study like high school level, postgraduate level or different professionals' papers holders. View and perception towards a product and services will be shown differently by people from different level of study. Therefore, to make the studies more accurate and precise, it is advices to add different education level of respondents as their aspect.

5.6 Conclusion

In a nutshell, the M-Banking adoption among undergraduates' students in UTAR Kampar is average and yet to be improved. Nowadays, M-Banking are the major trend in developed countries in performing transaction as compared to brick and mortar outlet. Therefore, government and financial institutions may provide education and effort in promoting mobile banking to develop a cashless society.

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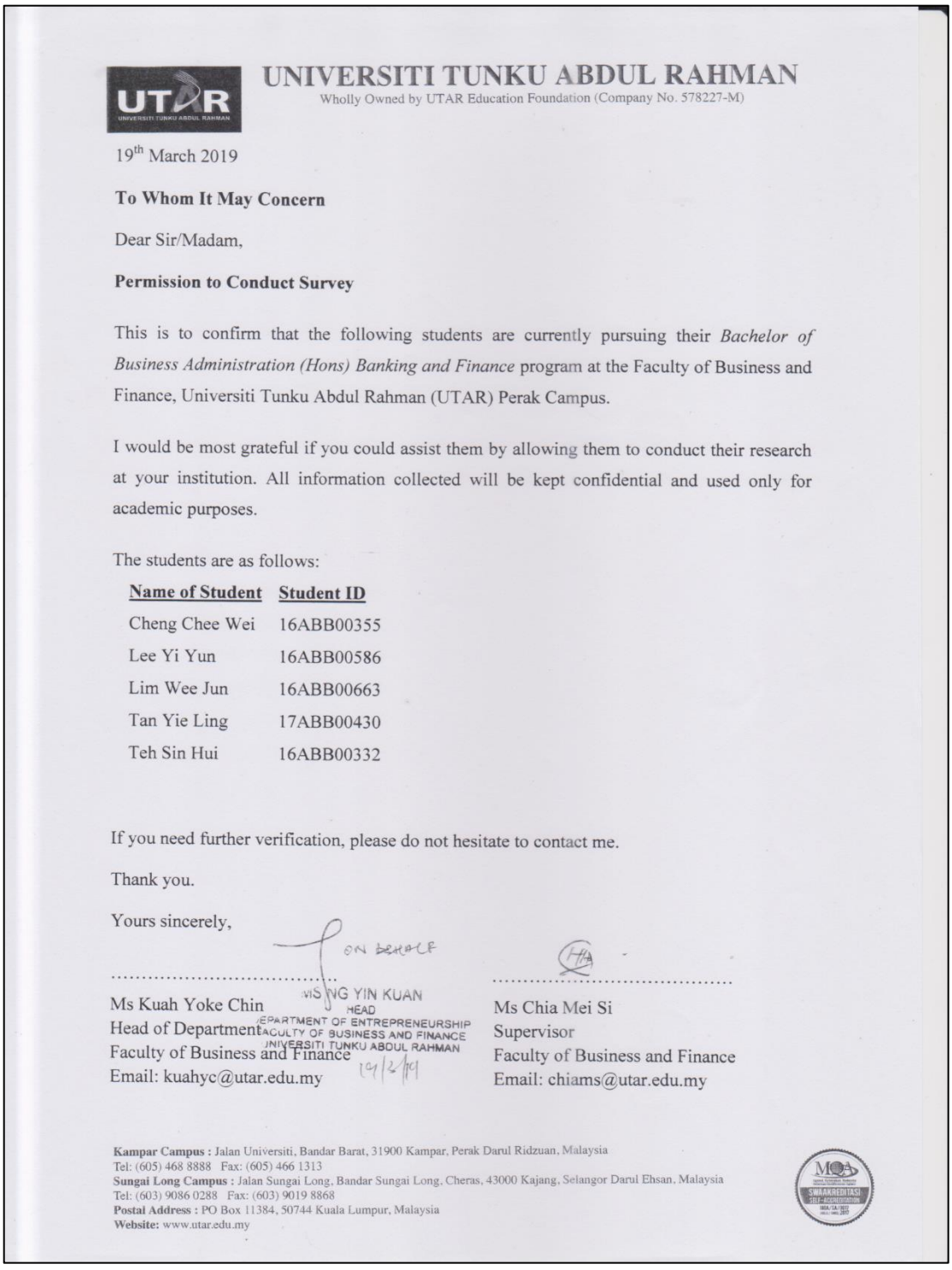
Appendix 3.1 Data of students in UTAR Kampar

UTAR STUDENT ENROLMENT (ALL STATUS) AS AT 28.02.2019
BACHELOR HONOURS DEGREE PROGRAMMES
(FULL TIME)

PROGRAMME	**TOTAL**
FACULTY OF ARTS AND SOCIAL SCIENCE	1733
FACULTY OF BUSINESS AND FINANCE	4466
FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY	1228
FACULTY OF SCIENCE	1262
FACULTY OF ENGINEERING AND GREEN TECHNOLOGY	678
INSTITUTE OF CHINESE STUDIES	228
SUB TOTAL	9595

Appendix 3.2 Survey Questionnaire Permission Letter



UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

19th March 2019

To Whom It May Concern

Dear Sir/Madam,

Permission to Conduct Survey

This is to confirm that the following students are currently pursuing their *Bachelor of Business Administration (Hons) Banking and Finance* program at the Faculty of Business and Finance, Universiti Tunku Abdul Rahman (UTAR) Perak Campus.

I would be most grateful if you could assist them by allowing them to conduct their research at your institution. All information collected will be kept confidential and used only for academic purposes.

The students are as follows:

Name of Student	Student ID
Cheng Chee Wei	16ABB00355
Lee Yi Yun	16ABB00586
Lim Wee Jun	16ABB00663
Tan Yie Ling	17ABB00430
Teh Sin Hui	16ABB00332

If you need further verification, please do not hesitate to contact me.

Thank you.

Yours sincerely,

.....
Ms Kuah Yoke Chin
Head of Department
Faculty of Business and Finance
Email: kuahyc@utar.edu.my

ON BEHALF
MS NG YIN KUAN
HEAD
DEPARTMENT OF ENTREPRENEURSHIP
FACULTY OF BUSINESS AND FINANCE
UNIVERSITI TUNKU ABDUL RAHMAN
19/3/19

.....
Ms Chia Mei Si
Supervisor
Faculty of Business and Finance
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Tel: (605) 468 8888 Fax: (605) 466 1313
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Tel: (603) 9086 0288 Fax: (603) 9019 8868
Postal Address : PO Box 11384, 50744 Kuala Lumpur, Malaysia
Website: www.utar.edu.my

Appendix 3.3 Survey Questionnaire Sample

UNIVERSITY TUNKU ABDUL RAHMAN
FACULTY OF BUSINESS AND FINANCE
BACHELOR OF BUSINESS ADMINISTRATION
(HONS) BANKING AND FINANCE

FINAL YEAR PROJECT

RESEARCH TOPIC:
Banking on The Go: Factors Affecting the Behavioral Intention towards M-Banking

Dear Respondent,

We are final year undergraduate students of Bachelor of Business Administration (HONS) Banking and Finance, Universiti Tunku Abdul Rahman (UTAR). The purpose of this survey is to seek the undergraduate student's opinion regarding mobile banking (M-Banking) services. Please answer all questions to the best of your knowledge. All responses are collected for academic research purpose only and will be kept strictly confidential. We appreciate your participation and feedback on this survey

Thank you for your participations.

Instructions:

1) There are THREE (2) sections in this questionnaire. Please answer ALL questions in ALL sections.
2) The contents of this questionnaire will be kept strictly confidential.

Group members:		
No.	**Name**	**Student ID**
1.	Cheng Chee Wei	16ABB00355
2.	Lee Yi Yun	16ABB00596
3.	Lim Wee Jun	16ABB00663
4.	Tan Yie Ling	17ABB00430
5.	Teh Sin Hui	16ABB00332

Questionnaires

Please tick (√) the following answer box for each question.

1. Are you using a smartphone?
   - □ Yes
   - □ No

2. Have you use mobile banking before?
   - □ Yes
   - □ No

Section A: Demographic Profile

1. Gender
   - □ Male
   - □ Female

2. Age

   ____ Years Old

3. Please tick your faculty:

   - □ Faculty of Business and Finance (FBF)
   - □ Faculty of Science (FSc)
   - □ Faculty of Information and Communication Technology (FICT)
   - □ Faculty of Engineering and Green Technology (FEGT)
   - □ Faculty of Arts and Social Science (FAS)
   - □ Institute of Chinese Studies (ICS)

4. Frequency of using mobile banking services.

   - □ At least one time every day
   - □ At least one time every week
   - □ At least one time every month
   - □ At least one time every year

Section B

Please indicate your degree of agreement on the following statements by circling the numbers given ranging from:

Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5

Dependent Variable – Behavioral Intention toward M-Banking

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
BI1	I will use mobile banking in future.	5	4	3	2	1
BI2	I will use mobile banking for my banking needs	5	4	3	2	1
BI3	I intend to use mobile banking.	5	4	3	2	1
BI4	To the extent possible, I would take advantage of mobile phone banking for my banking activities.	5	4	3	2	1
BI5	Given that I have access to a web-enabled mobile phone, I predict that I would use M-banking	5	4	3	2	1

Independent Variable

(i) Perceived Usefulness

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
PU1	I think that using mobile banking would enable me to accomplish my tasks more quickly	5	4	3	2	1
PU2	I think that using mobile banking would make it easier for me to carry out my tasks	5	4	3	2	1
PU3	Overall, I think that using mobile banking is advantageous	5	4	3	2	1
PU4	Use of mobile banking would make it easier for me to get information, e.g., bank statements, standing orders	5	4	3	2	1
PU5	I think that using mobile phone banking would improve the way in which I do my banking	5	4	3	2	1

(ii) Perceived Ease of Use

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
PEOU1	Mobile banking is easy to use.	5	4	3	2	1
PEOU2	Learning to use mobile banking is easy.	5	4	3	2	1
PEOU3	It is easy to become skillful in mobile banking.	5	4	3	2	1
PEOU4	Mobile banking is clear and understandable.	5	4	3	2	1
PEOU5	k that it is easy to use mobile banking to accomplish my banking tasks.	5	4	3	2	1

(iii) Perceived Risk

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
PR1	I think that there would be problems with my financial transactions while using mobile banking.	5	4	3	2	1
PR2	When using mobile banking, I may lose money because my account information is hacked.	5	4	3	2	1
PR3	I think that using mobile banking is financially risky.	5	4	3	2	1
PR4	Mobile banking would involve more financial risk when compared with traditional banking.	5	4	3	2	1
PR5	When transaction errors occur, I worry that I cannot get compensation from banks.	5	4	3	2	1

(iv) Relative Advantage

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
RA1	I think that using mobile banking can save my time in performing banking transactions.	5	4	3	2	1
RA2	Would you use mobile banking if there were benefits derived from using it?	5	4	3	2	1
RA3	Adopting mobile banking will allow me to conduct banking transactions more efficiently.	5	4	3	2	1
RA4	Adopting mobile banking will enable me to accomplish banking transactions more quickly.	5	4	3	2	1
RA5	Adopting mobile banking is a convenient way to conduct banking transactions.	5	4	3	2	1

(iv) Trust

	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
T1	Mobile banking is trustworthy.	5	4	3	2	1
T2	Mobile banking seems dependable.	5	4	3	2	1
T3	It is easy for me to trust a person/thing.	5	4	3	2	1
T4	I think that mobile banking application is reliable.	5	4	3	2	1
T5	In general, I trust mobile banking application.	5	4	3	2	1

- End of Questionnaire -

Appendix 3.4: Sources of Questionnaires

	Variables	Questions	Sources
BI1	Behavioral Intention toward M-Banking	I will use mobile banking in future.	Makanyeza (2017)
BI2		I will use mobile banking for my banking needs.	
BI3		I intend to use mobile banking.	
BI4		To the extent possible, I would take advantage of mobile phone banking for my banking activities.	Hanafizadeh, Behboudi, Koshksaray and Tabar (2014)
BI5		Given that I have access to a web-enabled mobile phone, I predict that I would use M-banking	
PU1	Perceived Usefulness	I think that using mobile banking would enable me to accomplish my tasks more quickly	Akturan and Tezcan (2012)
PU2		I think that using mobile banking would make it easier for me to carry out my tasks	
PU3		Overall, I think that using mobile banking is advantageous	
PU4		Use of mobile banking would make it easier for me to get information, e.g., bank statements, standing orders	Koenig-Lewis, Palmer and Moll (2010)
PU5		I think that using mobile phone banking would improve the way in which I do my banking.	Hanafizadeh, Behboudi, Koshksaray and Tabar (2014)

	Variables	Questions	Sources
PEOU1	Perceived Ease of Use	Mobile banking is easy to use.	Makanyeza (2017)
PEOU2		Learning to use mobile banking is easy.	
PEOU3		It is easy to become skillful in mobile banking.	
PEOU4		Mobile banking is clear and understandable.	
PEOU5		I think that it is easy to use mobile banking to accomplish my banking tasks.	Akturan and Tezcan (2012)
PR1	Perceived Risk	I think that there would be problems with my financial transactions while using mobile banking.	Akturan and Tezcan (2012)
PR2		When using mobile banking, I may lose money because my account information is hacked.	
PR3		I think that using mobile banking is financially risky.	
PR4		Mobile banking would involve more financial risk when compared with traditional banking.	Farah, Hasni and Abbas (2018)
PR5		When transaction errors occur, I worry that I cannot get compensation from banks.	Achieng and Ingari (2015)

	Variables	Questions	Sources
RA1	Relative Advantage	I think that using mobile banking can save my time in performing banking transactions.	Akturan and Tezcan (2012)
RA2		Would you use mobile banking if there were benefits derived from using it?	Chitungo and Munongo (2013)
RA3		Adopting mobile banking will allow me to conduct banking transactions more efficiently.	Lin (2010)
RA4		Adopting mobile banking will enable me to accomplish banking transactions more quickly.	
RA5		Adopting mobile banking is a convenient way to conduct banking transactions.	
T1	Trust	Mobile banking is trustworthy.	Malaquias and Hwang (2016)
T2		Mobile banking seems dependable.	Islam, Rahman, Ameen and Nower (2018)
T3		It is easy for me to trust a person/thing.	Zhou (2011)
T4		I think that mobile banking application is reliable.	Mu˜noz-Leivaa, Climent-Climentb, Liébana-Cabanillas (2017)
T5		In general, I trust mobile banking application.	