

UNIVERSITY OF EDUCATION, WINNEBA

**MOBILE PAYMENT SYSTEM USAGE AMONG TERTIARY STUDENTS. A CASE
STUDY OF KUMASI METROPOLITAN**



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STUDY OF KUMASI METROPOLITAN**



JOHN MURPHY

**A Dissertation in the Department of Information Technology Education,
Faculty of Applied Sciences and Mathematic Education, submitted to the School of
Graduate Studies in partial fulfilment
of the requirements for the award of the degree of
Master of Science
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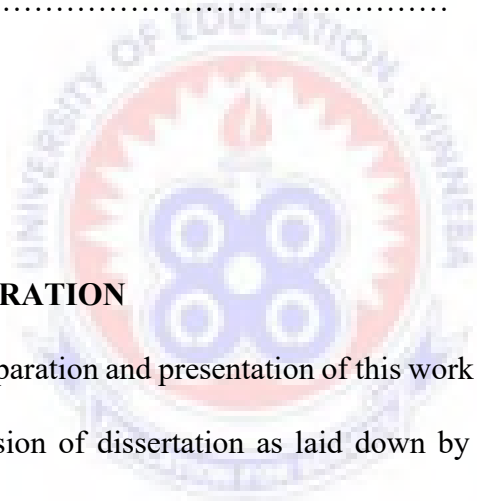
DECLARATION

STUDENT’S DECLARATION

I, **JOHN MURPHY**, declare that this dissertation, with the exception of quotation and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not submitted, either in part or whole, for another degree elsewhere.

SIGNATURE:

DATE:



SUPERVISOR’S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with guidelines on supervision of dissertation as laid down by the University of Education, Winneba.

(SUPERVISOR) : MR. WILLIAM ASIEDU

SIGNATURE:

DATE :

DEDICATION

This project work is dedicated to Mrs, Rita Owusu, my lovely wife and my children



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My first sincere thanks go to the Almighty God for giving me the strength to go through this work and my entire studies successfully. I also thank Mr William Asiedu, my supervisor, who spent time and energy in directing, correcting and encouraging me from the beginning to the end of this work. I also thank Seth Boahen who also assisted me when I called on him. I say I am grateful. For the encouragement and varied assistance provided for me and pushing me to complete this work, my lovely wife-Rita Owusu (Mrs.), I say thank you. Although this work represents my own efforts in expanding knowledge about Mobile Money System, I had to rely on several materials from various sources to enable me to accomplish this work. I acknowledge the contribution of these authors for making it possible for me.

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ABSTRACT

The primary purpose of the study was to examine mobile payment system usage among tertiary students in Ghana. The study employed a descriptive research design for the conduct of the study. Tertiary students from the University of Education Winneba-Kumasi and the Kumasi Technical University were considered as the population. Using the quota sampling technique, a total of 297 participants were sampled from the two institutions to participate in the study. Questionnaires were adopted as the main data collection instrument and the study discovered that tertiary students feel comfortable in using mobile payment systems on their own and are also able to initiate transactions on their own even if there was no one available to help them do so. Also, the study discovered that network challenges, easiness of sending money to the wrong person, too many transactional charges as well as the high probability of being defrauded while using the system, forgetting your PIN and the limitations on the amount one can conveniently cash out from a merchant are the major challenges confronting the use of mobile payment systems. It was then recommended that the benefits of educating students regarding mobile payment systems and services are that the knowledge of the system will be readily available to the students and most significantly the level of understanding will be high compared to the current situation. Also, it was recommended that mobile payment service providers strive to address promptly the challenges student faced by students while using the service to ensure that the services students feel safe and secured while using the service.

CHAPTER ONE

INTRODUCTION

1.1 Background

The world has become a global village, and almost everything is being done through technology. The development of information technology (IT) in the world is becoming a crucial factor in the future development of businesses and industries across the globe. The traditional method of sending and receiving money is gradually paving the way for a modern way of monetary exchange in the 21st century. Traditional banking as noted by Xu et al. (2018) and Luarn & Lin (2005) have been in existence for many decades and is the most usual method of engaging in monetary transactions in several countries. The past few years have witnessed an evolution in information technology (IT) to help smoothen business operations around the world, especially in money transactions where the use of Automated Teller Machine (ATM) was produced.

The growth in Internet banking followed, and finally, the emergence of mobile banking. Both the developed and undeveloped countries have profited and continue to benefit from emerging technology (University of Illinois, 2018; Liébana-Cabanillas et al. 2014; Rajgopal, 2012). The role of mobile payments in Ghana is not evident like other developed countries of the world. The financial institutions have a more significant part to play in this. Today, the incorporation of IT has changed how businesses are carried out all over the world. This has changed the way business is conducted and managed (Bong-Keun, & Yoon, 2013; Amoroso, & Watanabe, 2011). At present, in Africa, Ghana is regarded as one of the quickest growing Information Technology Compliant (ITC) nations.

According to Porteous (2006), the spread in the use of mobile technologies in a developing economy such as Ghana might have caused an upsurge in the number of mobile users to exceed the numbers of banks. Mobile commerce covers applications like mobile banking, mobile

payment, mobile marketing and others (see Hayashi, 2012; Chandra et al. 2010; Chatain, 2008). It is claimed that mobile payment systems have spread around the globe. This has brought about positive changes from customers' perception. In the case of Ghana, the subject matter has earned little or no attention in the literature. Thus, this research sought to bridge the gap in the literature. It is in this light that the researchers sought to test mobile payment system usage on tertiary students in Ghana.

Again, mobile payment systems have been more or less familiar to individuals around the world. This is because providers are facing price competition. Principal participants in the telecommunication industry have seen mobile payment systems as a future revenue source. Merchants and service providers are eager to expand market shares, increase customer satisfaction, and improve profit margins (Jia et al. 2015; Kim et al. 2010). Mobile payment systems seem to be a new lifestyle for the young and elderly. This implies a new possibility to execute business with, service providers (Kungpisdan, 2010). Though the supply side of mobile payment systems has been advertising, trying to develop the depth and width of service provided. Little progress has been achieved regarding students' experiences and perceptions of mobile service providers in Ghana.

Besides, thanks to technology, mobile users can immediately utilize their devices to make money transactions using applications installed on the phone. Besides payment, individuals can also store receipts, coupons, business cards, banknotes and so on, in their smartphones. When mobile devices function as wallets, it is named "Digital Wallet". The motivation for the current research came from several elements. Foremost, mobile money is a buzzword. In other words, it is a "trendy" topic that has been discussed in technical forums and financial websites for decades. One can see the word "Mobile Money" multiple times from the internet yet does not know what it entails. Thus, the research will help people understand mobile money, and how it can be used among tertiary students in Ghana.

The cash payment system controls financial transactions in Ghana (Bank of Ghana, 2009; Darkwa, 2009). This gives people immediate buying power, despite its carriage burden. Note that some developed economies prefer the term, Mobile Payment Systems (MPS). This helps people to transact, via Short Message System (SMS) (Sutter, 2009). Clients can glance over their phones through a device like Point-of-Sales Terminal (POS) for payments at shopping malls, as is the case in Japan and Korea (Sutter, 2009). Ghana uses MPS though it is not generally accepted unlike other countries (Sutter, 2009). Getting a payment scheme, like MPS among tertiary students in Ghana would help resolve the challenges in carrying bulky money to transact. This decrease money in circulation. It further promotes durability and convenience among users.

The focal point of this paper is to assess mobile payment system usage among tertiary students in Ghana. Students and the populace depend largely on cash for dealings, and as the world's payment systems are changing due to technological improvements. There is the need for Ghana to adapt to these changes to be a global player when it comes to payment systems. The Bank of Ghana (2014) defined a payment system as “the entire matrix of institutional infrastructure arrangements and processes in a country for initiating and transferring monetary claims in the form of commercial and central bank liabilities. In Ghana, this includes cash payments, cheque payments, card payments, and mobile payments. These payment systems are the instruments through which financial transactions are carried out.

The use of non-cash payment systems including mobile payment systems is not the dominantly used. The traditional payment system is fairly perplexed as it involves knowledge in the role of the mobile phone. There are also security-related issues that come with it. The best way for development in Ghana is a cashless society, hence, the use of mobile money services, whereby tertiary students, would have an enormous influence on the fiscal position of the nation. This

influence would lead to a reduction in the use of a cash system and in the cost of printing money, Microfinancing, banking, business efficiency, and employment opportunities.

1.2 Problem Statement

Studies in the area of e-payment have received lots of attention in develop world. However, this seems to be lacking in developing countries like Ghana. Therefore, Yang et al. (2012) and Wang (2012) pinpointed that there is a need to focus on the use of mobile money payment and consumer behaviour in developing countries like Ghana. It is said that MPS has brought positive outcomes in the lives of people, however same cannot be said for how it affects students' lives in Ghana. Hence, this study attempts to fill the gap on the use of mobile payment system among tertiary students.

Furthermore, despite the proliferation and advancement of non-cash payment instruments, Ghanaians are still very fond of cash. The Ghanaian populace is conservative when it comes to their payment habits. Nearly 60% intend to continue using simple payment instruments (Darkwa, 2009). Compared to other countries, cash is still a prevalent payment instrument in Ghana. It is unclear why Ghanaians especially tertiary students have such a strong preference for cash. Can it be that they prefer to carry a specific cash reserve for an unexpected transaction which can potentially only be settled in cash, or is it that they believe cash is a useful payment instrument to keep control of their money and spending? These are questions that beg for definite answers.

1.3 Purpose of the Study

The primary purpose of this study is to examine mobile payment system usage among tertiary students in Ghana.

1.4 Research Objectives

The study was guided by the following objectives;

1. To determine the factors that influence the usage of mobile payment usage among tertiary students in Ghana
2. To examine the perception of tertiary students relative to the usage of mobile payment systems in Ghana
3. To identify the challenges associated with the use of mobile payment systems in Ghana

1.5 Research questions

To achieve the above-mentioned purpose, it is necessary to answer the following questions:

1. What factors influence the usage of mobile payment system usage among tertiary students in Ghana?
2. What is the perception of tertiary students regarding the usage of mobile payment systems in Ghana?
3. What are the challenges associated with the use of mobile payment systems in Ghana?

1.6 Hypothesis

The conduct of the study was also guided by the ensuing hypothesis.

H₁ There is no statistically significant differences between the perception of male and female students uses of the mobile payment systems.

H₂ There is no significant difference in challenge among the male and female student in using the mobile payment system

1.6 Significance of the Study

The research is far-reaching. This research aims to provide a measurement of the usage and attitudes and to explore possible limitations that may prevent mobile payment systems from further usage. This research is pertinent to mobile payment service providers. As service providers seek to attract individual users and businesses to their services, a further understanding of their prospective customers' usage and attitudes will support them in improving their product, and ultimately, help them to satisfy the needs of their consumer.

Again, as there are legal gaps and a lack of clear regulations, legislators may find this research information to establish criteria for mobile payment service providers in Ghana. Lastly, academics may find this research of value in the field of social sciences. Moreover, in the field of technology, the adoption of MPS would have a significant effect on the fiscal stance of the country. The study would contribute to the literature on mobile payment systems in developing countries. This would serve as a reference for further research.

1.7 Limitations

Time was a major constraint on the conduct of this study as the researcher had to complete the study within the stipulated time allotted by the University to complete the research work. Additionally, the researcher was constrained by finance to carry out the study.

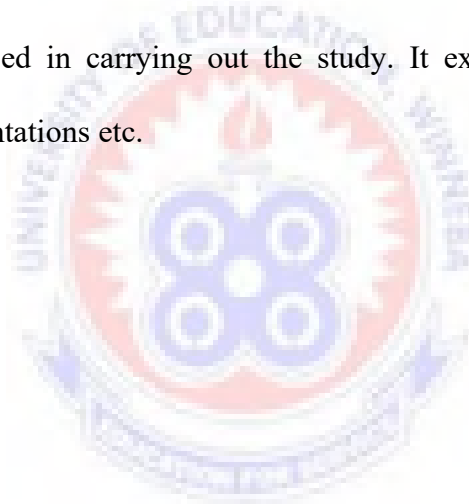
1.8 Delimitations

This study focuses on mobile payment system usage among tertiary students in Ghana. Hence the study will focus only on students from two tertiary institutions in Kumasi (University of Education Winneba-Kumasi [UEW-K]) and Kumasi Technical University [KSTU]). Tertiary students are crucial to understanding the usage of mobile money systems. Thus, the findings

will be limited to variables in the determined geographic area hence generalizations must be made with caution since the conclusion that may be obtained may not represent the entire opinions of all tertiary students in Ghana.

1.9 Organization of the Study

The study is organized into three main parts. Chapter one of the study is the general introduction to the topic. It examines the background to the study, problem statement, research objectives, research questions, limitations and delimitations of the study, the significance of the study etc. Chapter two reviews the relevant literature on the topic. Chapter three provides a detailed methodology used in carrying out the study. It examines the research design, samples, research instrumentations etc.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of the literature for the study and includes readings concentrating on literature relative to mobile payment system adoption among tertiary students in Ghana. It includes the argument of observed literature review for the research that defines the characteristics and terms that relate to the topic; the scope of the review focused on the main subject of mobile payments, the Mobile payment value chain; Mobile payment methods etc.

2.2 Mobile Payments

New technologies and digitalization of life are shaping the ways of doing business as well as the behaviours of consumers including tertiary students. In this new digital era, mobile devices have become one of the most prominent products ever to be produced. These devices and the services provided by them rapidly became necessities of daily life worldwide. The increasing popularity of these mobile devices around globally may be assigned to their omnipresent access to a wide range of services (communication, access to information, entertainment, or commerce). Mobile devices create value in a multitude of dimensions for their users. Another trend emerged with the increasing mobile device adoption is the movement towards mobile devices in accessing payment.

According to Kungpisdan (2010), as mobile devices have transformed into personal trust devices, mobile payment is recognized as interactions between parties in a mobile payment system with specific context and capabilities so that there is at least one party (Tan, 2004). Tan (2004) asserted that, fundamentally, the context of mobile payments includes any payment in which a mobile device is employed to ‘initiate, activate, and confirm’ the payment (p. 30). The mobile payment services are often carried out through a non-bank party (such as financial and credit institutions) independent of pre-existing bank accounts (Chatain, 2008).

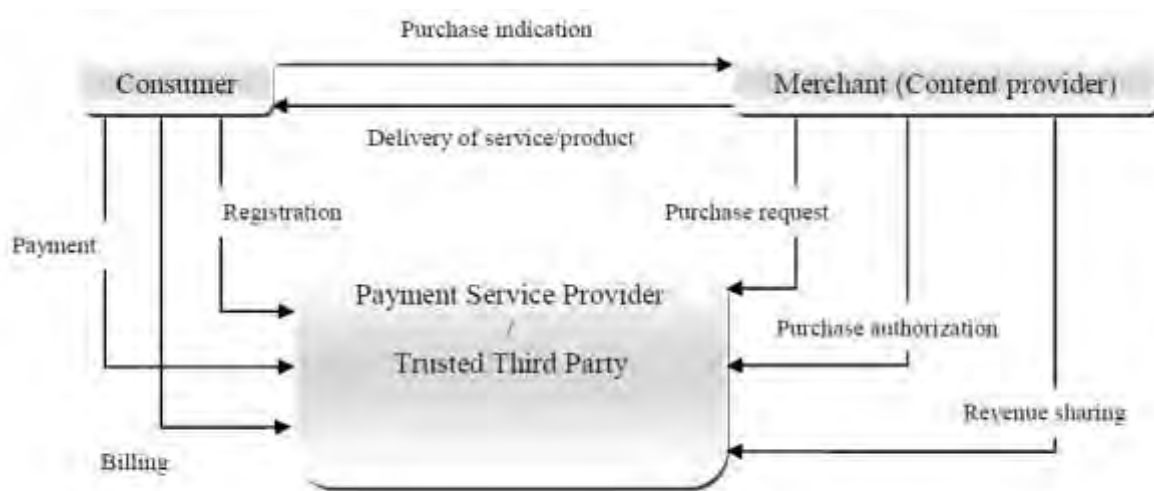


Figure 1 Conceptual Schema of the Mobile Payment System (Jan Ondrus, 2004)

There are three (3) elements that to best suit mobile payments. Foremost, a mobile device is the most convenient and possible payment technology for mobile context and service purchases. Second, the lessening use of cash provides the potentials to develop new substitute payment approaches for low-value transactions using financial service stations. Third, the cost-effective means to charge micro-payments in mobile commerce environment (Timo Saarinen 2005). As illustrated in Figure 2.1, mobile payment systems are merely registering and forwarding the authorized and validated payment transactions (Traunmüller 2002; Rotterdam 2008). According to Timo Saarinen (2005), payment request creation, payment request

authorization, and payment request committal is the integral aspect of payment system life-cycle.

Primarily, mobile payments occur between four (4) stakeholders; mobile consumers who subscribe to a service, merchants, who provide product or service to consumers, payment service provider, which controls the payment process and the trusted third party that administers the authentication of other players and the authorization of payment settlement. It must be noted that diverse functions can be fused into one and act as one component (Wen, 2005).

In Mallat (2007) view, mobile payments are defined as the utilization of mobile devices to handling a payment transaction through an intermediary, or directly without an intermediary. While this definition includes mobile payment, transactions conducted via mobile banking systems, a distinction between mobile payment and mobile banking services must be noted. Mobile banking services are based on banks' legacy systems and offered for the banks' customers. Mobile banking is used to denote banking services and facilities offered by financial institutions such as account-based savings, payment transactions and other products by use of an electronic mobile device.

2.2.1 The Mobile payment value chain

There are many different players in the mobile payment (McKitterick, 2002). This includes the merchant who sells products to the customer; the customer who owns the mobile device, and the payment service provider. This covers the mobile network operators, credit card operators, banks that controls transaction flows between merchants, mobile consumers and the trusted third party, and routing and enabling payment messages sent to mobile devices to be cleared

by the trusted third party. The trusted third parties, who are responsible for the connectivity, standardisation and interoperability issues of mobile commerce (Hu et al., 2005).

2.2.2 Mobile payment methods

Mobile payment is generally classified into two types: proximity (POS or token-based) or remote (account-based). Proximity payment allows customers to store their payment credentials in their mobile devices and converts the monetary value into unique identification symbols that hold sensitive data without compromising security (Hu et al., 2005). Nonetheless, due to the complex ecosystem of standards and stakeholders and the deficiency of supporting infrastructure. Proximity payment methods face significant challenges before they assume fast and wide adoption (Milena, 2009).

On the other hand, remote payment refers to the payment by phone initiated via a resident smartphone application or a mobile web browser, to process higher-value transactions via a secure WAP interface, using several technical methods (Hu et al., 2005; ISACA, 2010). Remote payment also covers payments that use Unstructured Supplementary Service Data (USSD) or short message service (SMS) technology to pioneer low-value transactions. For example, microlenders use USSD and SMS systems to provide microloan-payment services in Africa and parts of the Middle East. This is there is a high concentration of mobile devices but a lack of infrastructure, and low banking service penetration (ISACA, 2010; Lerner, 2013).

2.3 Benefits of mobile commerce and payment scheme

According to ISACA (2010), the proliferation of mobile internet is encouraging individuals to become more familiar with using smartphones for a wide variety of transactional purposes. These purposes include online shopping, initiating payment transfers via a bank website, securing contactless payments via a POS terminal, receiving micropayments from merchants,

or remotely paying for goods, and services using electronic wallet applications, etc. This is because mobile commerce and mobile payment methods encourage impulse purchasing since individuals do not need to have cash with them. Thus, it helps prevent the lost sales opportunities, which may arise if a customer leaves a store to get cash and does not return. Companies can increase revenue if they employ mobile payment systems (Lowry, 2016).

2.4 Mobile Payment Models

Transaction of digital value includes three phases namely, payment initiation, payment authorization, and payment settlement. Mobile payment models as Ondrus (2005) asserted, can be characterized based on some important features, such as payment amount, payment settlement mechanism, and the technologies which support the complete mobile payment system. About the monetary value of the payment, the substance of value will be digital or paper cash. Digital cash can be used as equivalent to paper cash. Essentially, it preserves the user's anonymity and enables off-line transactions. While in other models' payment value must be verified by third-party operators (Farsi, 1997).

Regarding the payment amount, the payment will be either macro or micropayment. A macro-payment usually involves amounts more than \$10, especially for credit card payments. As Unhelkar (2009) noted, a typical micropayment scenario basically will be reconciled by third-parties for authorization and verification request by the card-issuing bank. In other words, banks pay the mobile merchant for the user. While micro-payments normally deal with less than \$10 amounts and usually are charging users facilitated by a mobile network operator through the billing system (Petrova, 2008).

According to Ondrus (2005), mobile payments can be categorized into three types in terms of payment settlement mechanisms. Account-based payment systems, as noted by Petrova, (2008

are based on mobile phone numbers, smart card or credit cards. In account-based systems, the transaction amount is billed to the mobile subscriber's account or credit/debit card (Chbeir, 2010). Account-based payment model includes four parties: customer, merchant, issuer or customer's financial service provider, an acquirer or merchant financial institution. In some occasions, as Kungpisdan (2004) asserted, there might be another party called payment gateway as an interface between issuers and acquirers in the network of banking side and customer and merchant at the Internet side.

In this payment system, each user owns a specific account. Concerning the type of supporting technology, m-payments are classified into contactless and remote. 'Contactless' or 'proximity' payments are performed with the physical presence of a customer at the point of sale and actually 'face-to-face' or 'machine-to-machine'. Contactless payments use a radio-frequency interface between the mobile device and the beneficiary's payment device (Chbeir 2010, p. 345). However, remote mode transactions are performed over the network or 'over-the-air' (OTA). OTA services utilize mobile device facilities that transmit data via GPRS, 3G or WiFi.

Using OTA m-payment, consumers can initiate transactions at once from their devices to the payment service provider. In the OTA mode, the confidentiality and integrity of data will be fulfilled due to strong encryption and integrity circumstances (Finkenzeller, 2010). Proximity payments can be fully or partially settled 'over-the-counter' (OTC).

2.5 Mobile payment transactions

There are two main classes of mobile payment systems with different natures of mobile payment transactions. In OTC payments, the customer is physically present at the point-of-sale. But, the transaction is conducted using a wireless device using proximity communication

protocols. While, in OTA payments, payment transactions are performed where the consumer is physically remote from the point-of-sale and closer to Internet payment gateways. OTA payments require a more sophisticated infrastructure for wide acceptance of payment requests (Sachar 2004). To complete a mobile payment transaction, three steps must be successfully performed in sequence: payment request creation, payment request authorization and, payment request settlement (Montague 2010).

2.5.1 Mobile Payment Applications

Mobile payment applications can interface handling financial functions, which permit a user to perform various payments between the customer account, merchants and bank. Also, it helps to purchase goods, coupon and offers by different merchants using Smartphones. Thus, it primarily has taken to offer a safe route for payment request from customers to merchants, and vice versa when being used as POS on a merchant website.

2.5.2 Threats to mobile payment services

Security services must be provided for mobile payment service as there are some specific threats to mobile payment services. There are some common issues in mobile payment standards (Wen Chen Hu, 2005) they include the ensuing:

Security: This focuses on the integrity of the payment network. It is critical to increasing the security level by using security services. These services include confidentiality, authentication, integrity, authorization, availability and none-repudiation.

Interoperability: It is preferred that any typical payment method can be applied in any participating mobile commerce system.

Usability: It is required to consider users' consumption behaviour and habits to make the payment system more user-friendly.

Privacy: It is required to protect collected information of the participants of transactions took place over the Internet or stored locally on the client-side. This information can be useful outside of the transactions, so that any of that information may be linked in a way the participants without their consent. Privacy requirement prevents use or disclosure of any personal information and keeps them secure according to defined privacy policy and obligations.

To design desired payment options, Montague (2010) mentioned that issues such as regional support, consumer preferences and customer base should be considered. In developing markets, there are many security concerns for mobile payment systems. Depending on mobile payment architecture, there might secure connection either between the service provider and mobile operator or between the mobile operator and the user's mobile terminal or even a secure connection between user's mobile terminals. Hence, to assure a secure transaction, there is an implication that every secure transaction involving its entities (service providers, mobile peers and mobile operator) requires a trust level between all entities. All of the transaction players should be sure that its connection is extended in a secure way to other transaction participants.

Also, if the content of connection is being encrypted and decrypted by transaction peers, that may make it vulnerable to potential threats to each transaction entity. So, end-to-end authentication is a key feature. Moreover, in developing markets, m-payment service providers rely on agents for customer acquisition and payment verification. They use customer's sensitive information, and credentials for identification and authentication purposes. These agents are vulnerable to be compromised to customers' information leakage (Filip Zavoral 2010).

Furthermore, mobile devices are potentially vulnerable to malware performing unauthorized operations, such as sending sensitive user information using available connectivity features.

In the following, the most relevant research results are described to emphasize different aspects of payment scenarios and security arrangements corresponding to security threats and vulnerabilities, as well as interoperability and usability. In this payment, protocols comprise transaction parities including customer, merchant, agents, service provider, and mobile operator network.

2.6 Factors affecting the adoption of Mobile Payments among tertiary students

Research on mobile payments can be categorized into two categories namely, adoption and system impact with consumers, and use of such systems in social, economic, and cultural context (Wang, 2012). In the adoption and system impact of students' stream of research, the Technology Acceptance Model (TAM), has been used extensively. For example, Jia et al. (2015) attempted to understand the adoption of mobile payments. The study found that students with exposure to mobile payments are likely to search for information about mobile payments. They also argued that exposure to mobile payments and consumers' information search increases the trust in mobile payments.

The trust in mobile payments is more significant for non-users than for users in encouraging them to use mobile payments (Jia et al., 2015). Daştan and Gürler (2016), found that there is a negative relationship between environmental risk and perceived trust. So, there is also a positive relationship between a firm's reputation and perceived trust, in the context of the adoption of mobile payments. The authors argued that environmental risk and firm reputation are associated with trust. The results of this study did not show any significant effect between the perceived ease of use and adoption of mobile payments.

Jia et al. (2014), in a study assessing the effect of technology usage habits on student's intention to continue using mobile payments, present a set of behaviours that would enhance or positively impact usage of mobile payments. These are consumers' online shopping habits, consumers' mobile services (such as text messaging using Short Message Service (SMS), entertainment, and consumers' cell phone usage habits. Individual differences and characteristics of mobile payment systems affect the intention of usage (Kim et al., 2010).

Individual differences include the knowledge of the system and mobile payments. System characteristics include convenience, compatibility and reachability of the system, within the above study (Kim et al., 2010). Trust and perceived risk also affect consumer acceptance of mobile payment systems through perceived usefulness and perceived ease of use (Chandra et al., 2010; Shin, 2010). These variables (perceived usefulness, perceived ease, trust, perceived risk etc.) will be discussed in the subsequent sections. Students are likely to adopt mobile payment services if they feel that their beliefs and behavioural pattern are aligned with user expectations. It also suggested that perceived usefulness and perceived security of mobile payment methods positively impacts the student's intention of using mobile payments. The subjective norm in terms of the influence of peer groups has a positive impact on mobile payment usage. The study did not find a relationship between perceived ease of use and the student's intention to use mobile payments in restaurants.

Mallat (2007) conducted a qualitative study of consumer adoption of mobile payment systems and identified several barriers to the adoption of mobile payments, including perceived risks, premium pricing for payments made through mobile services, the complexity of payment procedures, low adoption rates, perceived incompatibility with large value purchases, and lack of merchant acceptance. Results specified that perceived risks of using mobile payments were reduced when there was trust in mobile payment service providers and merchants, suggesting that more reliable service providers have an advantage over smaller competitors. Cyril et al.

(2008) examined security factors influencing the acceptance of mobile payment systems in Malaysia. Their findings looked at the impact of trust and how it influenced users' intention to use mobile payment services. The issue of security emerged as a major barrier to the acceptance of mobile payments.

2.7 Attitudinal determinants of technology adoption among tertiary students

It cannot be overemphasized that the process of diffusing mobile payment technology throughout society is complex. There are economic, social, cultural and functional uncertainties as mentioned above. Information Systems (IS) researchers have examined determinants of acceptance, intention to use, and actual usage of information technology of community, students, faculty and staff for several decades. The primary adoption theory applied to tertiary students is the Technology Acceptance Model (TAM). The Universal Technology Adoption and Use Theory (UTAUT) has more recently been used in research on mobile payment acceptance, effectiveness, and use in the delivery of payments (Tibenderana & Ogao, 2008; Williams, 2009). Both TAM and UTAUT seek to answer questions about technology adoption. The TAM by Davis (1989) is mostly used because of its advantages, such as its excellent measurement properties, empirical soundness, and conciseness (Pavlou, 2003). Based on the model, Davis posits two attitudinal determinants, namely, perceived usefulness (PU) and perceived ease of use (PEOU) in predicting the adoption of new technology. However, perceived compatibility (PC) and social norm (SN) were integrated into the original TAM to form a strong conceptual model for this study.

2.7.1 Perceived ease of use

There is a consensus among social scientists that perceived ease of use influences the intention, attitude, usefulness and actual use of new technology (Chau, 1996). According to Amoroso & Wantabe, (2011), perceived ease of use is the degree to which mobile payment systems are believed to prevent mental and physical effort. Chau found that people may reject a new technology if it requires continued application of knowledge, even though this same factor will not significantly affect their future intention to use it (Murthy & Mani, 2013) once the technology is established. Gefen & Straub (1997) have observed that at the moment when people are using a system to pay for a product or service they are much more likely to develop an intention to use it than when spontaneously seeking out general information about a system.

2.7.2 Perceived usefulness

Researchers such as Davis, et al. 1989; Doll, et al., 1998; Erikson, et al., 2004; Henderson & Divett, 2003; Lee, Fiore, & Kim, 2006; McKechnie, Winklhofer, & Ennew, 2006 have described perceived usefulness as the extent to which an individual has confidence in using an appropriate system to increase his or her job performance. Since individuals are more likely to adopt a technology if the overall improvement on the job can result in usefulness in productivity and job efficiency. In a previous study by Agarwal & Venkatesh (2002), usability indicates the quality of websites while from Szymanski & Hise (2000) study suggested that usability factors like site design were strong indicators of satisfaction. The website design has a connection with the usability of the system which leads to ease of use. Mobile payment systems must make users feel impersonal about user-friendliness and ease of navigation to increase usability. Thus, Davis, Bagozzi & Warshaw (1989) findings specified that mobile payment user's decision making on the adoption of mobile payment system is influenced by perceived usefulness.

2.7.3 Perceived Compatibility

Compatibility in the related literature is defined by Schierz, Schilke, & Wirtz, (2010) as the degree to which using a new system is perceived as consistent with the existing values, beliefs, experiences, and needs of individuals. Compatibility is considered as an important component of technology adoption models, and incompatibility of the individual's values with the innovation is accepted to impede the adoption (Rogers, 2003). Moore & Benbasat (1991) demonstrated that perceived relative advantage, compatibility and complexity were among the antecedents of technology acceptance behaviour. These three (3) dimensions were also found to be significant elements of innovation characteristics related to adoption by Tornatzky & Klein (1982).

Previous research on technology adoption such as Karahanna, Agarwal, & Angst, (2006) and Schierz et al., (2010), has revealed positive effects of compatibility on attitudes towards and perceived usefulness of various information systems. These effects were also observed in mobile payment, and other financial services contexts (see Chen & Nath, 2008; Dash, Bhusan, & Samal, 2014; Mallat, Rossi, Tuunainen, & Öörni, 2009; Wu & Wang, 2005; Yang et al., 2012). Furthermore, Chen & Nath (2008) found compatibility to have the strongest effect on the acceptance of mobile payment systems. We expect people's lifestyles to affect their view towards mobile payment services. An individual preferring cash as his/her major payment method due to the lifestyle or values will have low compatibility with mobile payment systems. Consequently, it is expected for that individual to develop a negative attitude towards these systems (Shatskikh, 2013). Compatibility is expected to affect student's attitudes towards mobile payment systems and use intentions (Kim et al., 2010; Lu, Yang, Chau, & Cao, 2011).

2.7.4 Attitude toward the use

The term attitude toward use measures the positive or negative feeling of an individual about using new technology. Fishbein & Ajzen (1975) found that an individual's decision to use or not to use a new technology hinges on that individual's positive or negative convictions about using that particular technology.

2.7.5 Perceived value

The perceived value of mobile payment systems can be described as the trade-off between what customers sacrifice, such as price, transaction cost, opportunity cost, time and efforts, and what they receive such as the benefits and utilities. Parasuraman et al. (1985) describe perceived value as the link between a student's satisfaction with superior service and the concept of 'surplus' – as it appears in economics. Kuo et al. (2009) cited in Amoroso & Watanabe, (2011) describe perceived value as 'the difference between the highest price customers are willing to pay for a product or service, and the amount practically paid' (p. 101).

2.7.6 Perceived Security and Privacy

According to Yang & Forney (2013), the functional uncertainty inherent in any new technology usually leads to a specific level of perceived security and privacy concerns. In the context of a mobile payment wireless environment, the fear of identity theft, security breaches and passive confidentiality often discourage users from using the service (Yang et al., 2012). As pointed out by Dunphy & Herbig, (1995), the more risk-averse a subject is, the lower its acceptance and longer the diffusion will take' (p. 203).

2.7.7 Social influence

The beliefs of people are important to an individual including family, friends and reference groups and this, in turn, affects the individuals' intention to behave in a certain way. When consumers encounter a new technology product, they may feel a certain uncertainty regarding the product and the consequences of its use. This uncertainty may be minimized by getting the opinions of people they value. In mobile payment systems, this effect may be defined as the way the individuals' social environment perceives mobile payment systems (Schierz et al., 2010).

This concept in its classical form was defined by Fishbein & Ajzen (1975) as 'the person's perception that most people who are important to him think he should or should not perform the behaviour in question' (p. 302). Empirical evidence confirming this assumption was found in the literature on various new technology systems and services settings (Hu, Poston, & Kettinger, 2011; Leng & Lada, 2011; Venkatesh & Davis, 2000) and in mobile services context (Liébana-Cabanillas et al., 2014; Lu, Yao, & Yu, 2005; Oliveira). In line with the theoretical foundations and relevant studies, social influence is expected to affect attitudes towards mobile payment systems.

2.7.8 Trust

Trust is described as the degree of risk in financial transactions, and the consequence of the trust is reduced perceived risk and thus will lead users to positive intentions toward the use of mobile payments (Yousafzai et al., 2003). Mobile payment transactions are performed within users' expectations that explain users' trust (see Tsiakis & Sthephanides, 2005; Mallat, 2007). Linck et al. (2006) and Kousaridas et al. (2008) noted that trust could obtain higher gains in

the outcome while distrust avoids potential losses in the future. Users can thus make their own choices or decisions to trust or not to trust.

This is proven in previous studies from Hoffman et al. (1999), Friedman et al. (2000), Jarvenpaa et al. (2000), Gefen (2003) and Wang et al. (2003). These researchers specified that trust involves online exchanges of money and is significant in the determination of how it influences customers' willingness to adopt mobile payment systems. Abrazhevich (2001) and Chou et al. (2004) asserted that trust is important for understanding interpersonal behaviour and business in terms of economic exchanges, which will affect users' opinion toward mobile payment systems. According to Gefen (2000), it is extremely important that users' trust in an Internet environment.

Studies conducted by Zhou (2011) discovered that due to the high degree of uncertainty and risk presented by online transactions, this would emphasize the importance of trust in mobile payment. Without trust in the system, it will be extremely difficult for mobile payment to achieve a broader usage (Lim et al., 2006). A study carried out by Kniberg (2002) confirmed that the adoption of mobile payment systems is reliable if trustworthiness is perceived. Users' confidence that their personal information and money will not be used without their permission or acknowledgement or against their interest is paramount. Kniberg (2002) noted that consumers and merchants are more willing to use an unstable payment system that a trusted company provides more than an untrustworthy one. Thus, trust alone according to Hoffman et al. (1999), is not sufficient enough to persuade consumers to switch to mobile payment systems with the existence of various critical factors.

2.7.9 Behavioural intention

Behavioural intention refers to an individual's intention to behave in a certain way, which in turn determines the actual usage of a system. According to this theory, people are believed to have competing 'capacities' if they intend to do something. Yang et al., (2012), suggests that behavioural intention is negatively correlated to the attractiveness of alternatives and perceived risk.

2.7.10 Perceived Risk

Perceived risk is the subjective belief that a certain product or service will precipitate loss if used to perform an activity. The perception of suffering a loss if a sensitive message is shared with a mobile vendor creates fear over disclosing information with a vendor using a mobile phone (Amoroso & Watanabe, 2011). As Lu et al., (2011) specified, building trust mitigates the issues of perceived risk.

2.7.11 Attractiveness of alternatives

In this context, 'attractiveness of alternatives' considers the availability of competing alternatives in the marketplace, and measures the extent to which they affect the customers' intention to use new technology (Shin, 2009). Mobile payment systems are still in their infant stages, and bigger obstacles are preventing their universal adoption.

2.8 Review of Relevant Theories

2.8.1 Technology Acceptance Model

Technology acceptance model is an extension of the theory of reasoned action (TRA) model which was introduced by Davis in 1986. this theory is mainly based on the idea of technology adoption; TAM replaced TRA with two technological accepted features, perceived usefulness as mentioned earlier and perceived ease of use which has been proven to be of significance to

the adoption of technologies such as mobile payment systems. Bong-Keun Jeong & Yoon (2013) studied the TAM model in their study which investigated consumer acceptance of mobile payment services, by explaining relationships that exist between variables such as PEOU, PU, PC, PSE and the results indicated that perceived usefulness, perceived credibility, perceived self-efficacy and PEOU influence the adoption of mobile payment systems, but the results revealed that PU had more significance than the rest of the variables in influencing consumers to adopt mobile payment services.

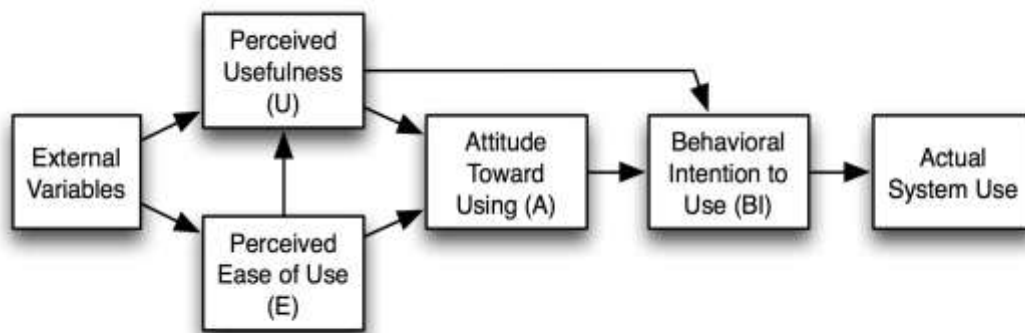


Figure 2 Technology Acceptance Model (Source: Davis 1989)

Daud et al. (2011) used the TAM model to analyse relationships between variables that influenced the adoption of mobile banking in Malaysia. The findings of the study revealed that the model is capable of predicting intention to adopt mobile banking, Perceived Usefulness, PC and awareness were given high priority in this study and the results proved the idea to be useful because these variables showed that they have a high effect on individual intention to use mobile banking. Other models that were used after TAM were such as the ETAM which were proven to be able to predict the intention to use new technologies. This model like many others that followed was criticized many times due to its limitation in explanations, failure to acknowledge social processes of Information System development and implementation and its inability to predict outcomes. As a result, it was redefined several times.

Benbasat & Barki (2007) criticized the model specifying it did not serve its original purpose, notwithstanding the opposition, many inquiries still support the use of this model as an excellent model that can explain the acceptance of information system. Carter & Belanger (2005) for instance, have recommended the integration of the TAM model with other models such as IDT to have a more accurate and deep explanation of the variables. The relation of the theory to this study is that TAM incorporates two important constructs which are PEOU and Perceived Usefulness, these two variables have been widely explored by many researchers to study behaviours, and in this study, they were also applied to comprehend whether they will have the same effect.

2.8.2 Theory of Reasoned Actions

The Theory of Reasoned Action (TRA) is a widely used model from social psychology studies. It is concerned with the determinants of consciously intended behaviours. It was developed by Ajzen & Fishbein, (1975) and (1980). The Theory of Reasoned Action is also a continuation of past theories. The Theory of Reasoned Action assumes that the individual's Behavioural Intention (BI) to act is determined by their attitude toward performing the behaviour (ATB) and Subjective Norm (SN). It can be perceived that three (3) vital constructs and thus behaviour intentions, attitude and subjective norm. Attitude according to this theory is about beliefs while subjective norms are about expectations. Subjective Norm (SN) is defined by Ajzen & Fishbein, (1980).

TRA is still widely acknowledged as a general model that does not directly state specifically the beliefs that are operative for a certain behaviour; it suggests that a person's behaviour is determined by the intention to perform a specific action. The developers of this theory thus, Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980) recommended using modal salient

beliefs for the population obtained by taking the beliefs most frequently drawn out from a representative sample of the population. The TRA was also successfully applied in a reasonable number of times to predict the performance of behaviour and intentions. An example was when TRA was used to predict education in a study by Fredricks & Dossett (1983).

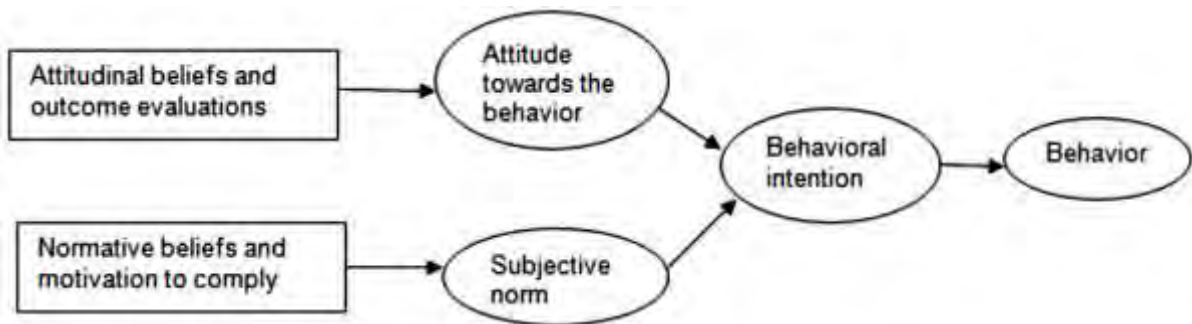


Figure 3 Theory of Reasoned Action (Source: Fishbein and Aizen 1975/1980)

2.8.3 Theory of Planned Behaviour

This theory was developed by Fishbein (1975) and Ajzen (1980) it was developed as a result of the failure of the TRA when it was discovered that behaviour was not voluntary. According to Ajzen (1980), The theory advocates that only those specific attitudes toward the behaviour in question can be expected to predict behaviour.

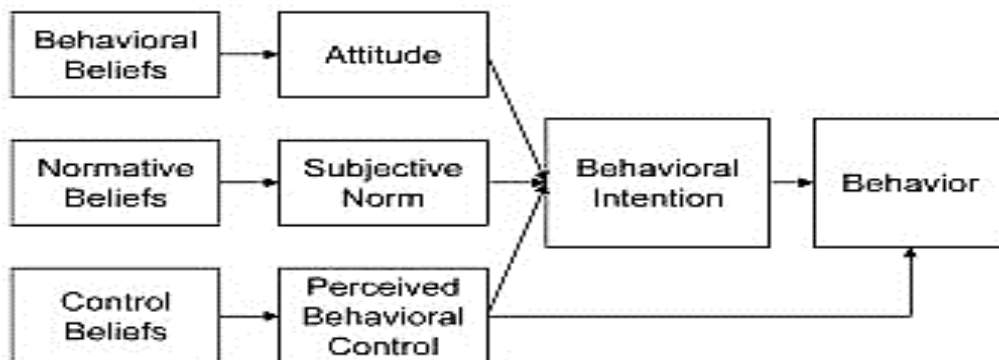


Figure 4 Theory of Planned Behaviour (Source: Ajzen 1991)

The theory faced criticism from Sheppard et al. (1988) who contended about two important issues that made this theory problematic, that is, first of all, using the theory needs to someone

to differentiate behaviour from intentions and secondly, there is no requirement in the theory for considering whether the chances of failing to perform is due to one's behaviour or intentions. As a solution to the previous errors, Ajzen (1985) extended the TRA by adding another construct called perceived behavioural control (PBC), which in this case predicted jointly intentions and behaviour. The extended model is what is termed the theory of planned behaviour (TPB).

With careful consideration, it can be perceived that the two theories of TRA and TPB are similar to each other in that, in both theories behaviour intentions is an important element in predicting the actual behaviour. The main difference between these two theories is that the TPB added more constructs to the model and thus Perceived Behavioural Control (PBC) as the determinant of Behavioural Intention and control beliefs that affect the perceived behavioural control.

The reason for including the PBC is because the perceived behaviour control is an external variable that has both a direct and indirect effect on actual behaviour intentions. The Theory of Planned Behaviour has been successfully applied to many studies such as Taylor & Todd, (1995) and Venkatesh et al., (2000) in predicting the performance of behaviour and intentions. These study outcomes provide evidence on how beneficial and right it is to use these two theories for studying technology usage behaviour.

2.8.4 Innovation Diffusion Theory

Rogers (1995) who is the architect of theory, describes innovation as an idea, act, or instrument that is new to an individual or a group of people while Diffusion is a process in which new technology is transferred through certain channels of communication in time among individuals who are targeted to use new Information System. Innovation Diffusion Theory (IDT) has five

innovation characteristics; relative advantage, compatibility, complexity, and trialability and observability. These variables may look different and unrelated to, however, in reality, have everything to do with each other in the context of information systems.

Moore and Benbasat (1991) argued that TAM and IDT are only theoretically related. In reality, the relative advantage construct in IDT is similar to the notion of the PU in TAM, and the complexity construct in IDT captures the PEU in the technology acceptance model, although the variables sound different. Medlin, (2001) and Parisot, (1995) asserted that Rogers' diffusion of innovations theory is the most appropriate theory among all theories for investigating the adoption of technologies in tertiary education and educational environments.

2.8.5 Decomposed Theory of Planned Behaviour

The Decomposed Theory of Planned Behaviour was developed by Taylor and Todd (1995). As specified by Luarn and Lin, (2005), the theory was developed by releasing some features of attitude, subjective norm and perceived behavioural control. Suoranta and Mattila (2004) emphasized that the decomposed theory of planned behaviour offers a comprehensive approach to understanding the factors affecting an individual's decision to use technology information.

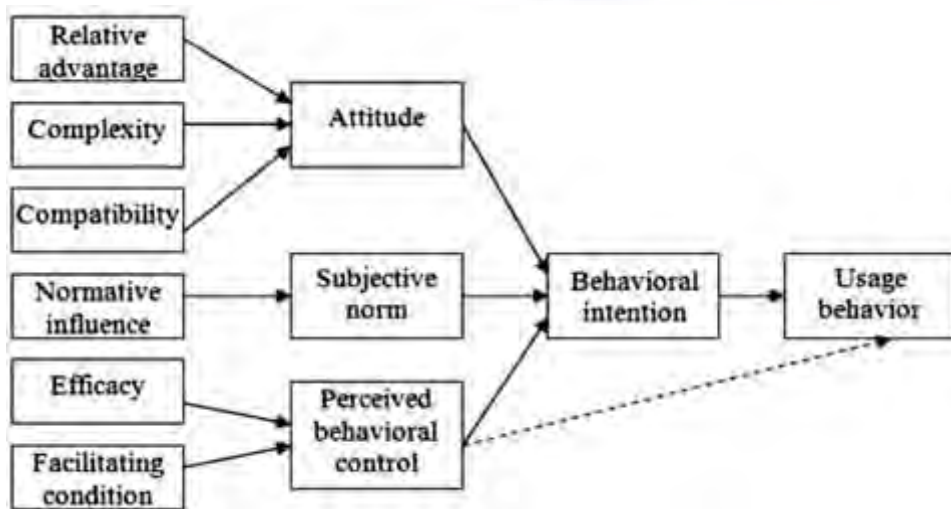


Figure 5 Decomposed theory of planned behaviour (Source: Shih & fang 2004)

2.8.6 Unified Theory of Acceptance and Use of Technology

A unified theory of acceptance and use of technology by Venkatesh et al. (2003), is a more complex theory which explains an individual's intentions to use technologies and how differences between people can influence the use of new technologies, it was introduced after a critical review of the theories and models of information system which are, TRA, TAM, TPB, CTPB and IDT. The theory assumes that variables such as PEOU and PU can influence adoption. However, this can vary depending on age, gender and experiences of the persons who are introduced to new technology. Venkatesh et al., (2003) notes that the UTAUT theory establishes that the effect of core constructs is moderated by gender, age, experience, and voluntariness of use.

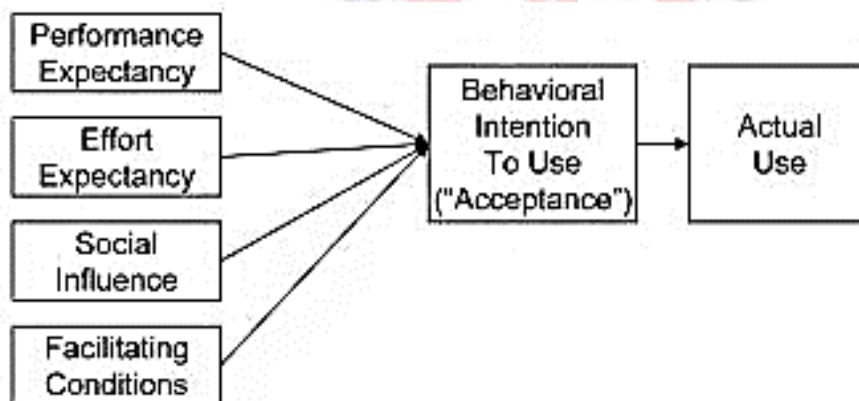


Figure 6 Unified theory of acceptance and use of technology (Source: Venkatesh et al. 2003)

The theory attracted a lot of criticism from several scholars such as Van Raaji & Schepers (2008) who criticized the theory noting it lacked enough information to yield accurate results hence does not guarantee precise information in the results of any study. Bagozzi (2007) also criticized the theory, insisting the theory was clear in its targets, however, it has too many variables which made it complex and confusing enough to cause chaos for both the researcher and reader.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

A research design is a conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement, and analysis of data (Cohen et al., 2011). Saunders et al. (2012) emphasized that the selection of any research design is based on numerous constituents with the ultimate being the attributes of the variables or population being used or investigated. In this study, a descriptive research design will be used due to the nature of the study. The descriptive research design specifies the nature of a given phenomenon (May, 2011). Thus, it is generally concerned with the present status of a given phenomenon.

Descriptive research (Saunders et al., 2012) also refers to research studies that have as their primary objective the accurate portrayal of the characteristics of persons, situations or groups. This approach will be employed to describe variables rather than to test a predicted relationship between variables. Again, since different research designs attempt to answer different types of research problems, Bryman (2012) asserts that the choice of research design must be grounded on the nature of the research, its setting, the possible limitations and its underlying paradigm that informs the study.

Furthermore, the descriptive survey design is deemed appropriate for the study as it is versatile and practical; in that, it identifies present conditions and points to current needs (Creswell 2015). Other specific reasons for using descriptive research design was that, it;

Determines and reports the way things are

- Involves the collection of data to test research questions concerning the current status of the subjects of the study.

- Makes it possible to observe, describe and document aspects of a given situation as it naturally occurs.

Moreover, descriptive research answers the questions on what, when, who, where, and how. Thus, the descriptive design will be appropriate for this study as it is essential to understand the dynamics of mobile payment system usage among tertiary students in Ghana.

Additionally, this study will employ a quantitative approach for data collection and analysis. According to Leavy (2017), research can be conducted mainly within three (3) paradigms. These according to Creswell (2015) include the quantitative, qualitative, and mixed-method. The basic paradigm of quantitative research is positivism. According to this paradigm, science is characterized by empirical research and all phenomena can be summarised into empirical indicators, which characterize the truth. The ontological bearing of the quantitative paradigm is that there is only one truth that is an objective reality, and that exists independent of human perception (Lewis & McNaughton, 2013).

According to Saunders et al. (2012), epistemologically, the investigator and the investigated are separate entities. Thus, the researcher is capable of studying a phenomenon without influencing it or being influenced by it. The goal of the researcher is to measure and analyse causal relationships between variables with a value-free from work. Techniques utilised to ensure these approaches include written or verbally administered questionnaires with a restricted series of predetermined answers (Jonker & Pennink, 2010).

3.2 Population

According to Saunders et al. (2012), population refers to a full set of groups from which a sample is taken. The target population for this study was students from two tertiary institutions in Kumasi (University of Education Winneba-Kumasi [UEW-K]) and Kumasi Technical

University [KsTU]). Using two different levels of tertiary institutions for the study was important, as it allows obtaining data from two different perspectives of students. Tertiary students are crucial to understanding the usage of mobile money systems. The focus on tertiary students was influenced by the study of Ito & Daisuke (2010) who observed that although mobile payment has become common in all age groups, the younger demographic has a higher volume and unique patterns of usage which differentiate them from older users. The quota sampling technique was used to draft out the sample from the target population.

3.3 Sampling Technique

According to Saunders et al., (2012), sampling cannot be avoided in research because it is impracticable to survey the entire targeted population due to budget and time constraints. This study used a non-probability sampling method. According to Gentles et al. (2015), non-probability sampling methods provide a range of alternatives in terms of techniques that can be used by the researcher. Hammond & Wellington (2013) noted that quota sampling is a type of stratified sample in which a selection of cases within strata is entirely non-random. The Quota Sampling technique was adopted in this study.

Quota Sampling is a non-probability sampling method in which the researcher can form a sample involving individuals that represent a population and are chosen according to traits or qualities. Researchers can decide the trait as per which the sample subset selection will be conducted so that the sample can be useful in collecting data that can be generalized to the entire population. The final subset will be decided only according to the researcher's knowledge of the population (Battaglia, 2008). Thus, the population will be divided into specific groups; then the quota will be calculating for each group after which a determination will be made on the specific conditions to be met and quota in each group.

The quota sampling will be used because the researcher has specific criteria for conducting research, and this will allow the selection of subgroups, due to which it will become extremely convenient for the researcher to obtain the desired results needed (Gentles et al. 2015). However, before the application of the sampling technique, the researcher will use the Sample Size Determination Table by Krejcie and Morgan (1970) to determine the exact number of students to be surveyed from both institutions. Using the convenience sampling, data collection instruments will be distributed to students till the quota will be obtained for each university.

3.4 Data Collection Instrument and Techniques

Data collection will be done through both secondary and primary sources. The study will use a questionnaire as the research instrument to collect primary data for the study. The questionnaire was a valuable method of data collection in this study. It is an appropriate method to attain information systematically about variables often not easy to observe, such as attitudes and intentions (Mark, 2015; Babbie, 2010). Furthermore, the questionnaire was a quick method of obtaining primary information from the participants in a non-threatening way. The main reason for employing a questionnaire will be to address research some research questions to determine the level of mobile payment system usage among tertiary students in Ghana.

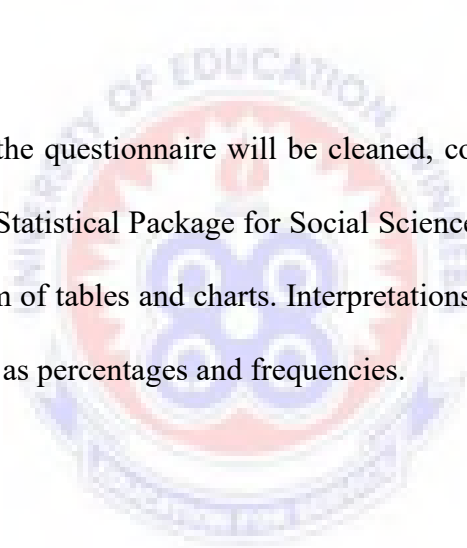
A self-administered questionnaire will be distributed to respondents. The questionnaire will contain both open and closed ended questions. The response format will be based on a 7-point Likert-scale rating pattern with weightings of Strongly Disagree=1, Disagree 2, Somehow disagree=3, Neutral=4, Somehow Agree=5, Agree=6, Strongly Agree=7. The average of these points is $4.0 (7+6+5+4 + 3 + 2 + 1) = 4.0$ thus $28/4$. This will be used in the data analysis.

3.5 Ethical Considerations

The researcher will take the following steps to ensure that the study met appropriate ethical standards: The research objectives will be clearly stated in writing including a description of how the data would be used and each participant received a verbal briefing. The participants will be informed of all data collection devices and activities. The participants' rights and interests will be considered when choices were made regarding reporting the data. An explanatory statement and consent form will accompany the questionnaire as part of ethical practices. Participants' responses will be anonymous.

3.7 Data Analysis

The data gathered through the questionnaire will be cleaned, coded and analysed using data analysis application IBM's Statistical Package for Social Sciences (SPSS) version 21. Results will be presented in the form of tables and charts. Interpretations of the findings will be made using descriptive tools such as percentages and frequencies.



CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents the analyses and interpretation of the data that was collected in the conduct of this study. The analyses conducted are presented in five parts; (i) the demographic data results, (ii) descriptive statistics of measures, (iii) level of GSCM adoption (iv) measurement model analysis, (v) extended institutional pressures construct, and (vi) structural model analysis.

4.2 Descriptive Statistics results

Table 4.1 Gender of respondents

Gender	Frequency (<i>n</i>)	Percent (%)
Male	145	49.0
Female	152	51.0
Total	297	100.0

Source: Fieldwork 2020

Analysis of the gender of respondents revealed that there was a fairly equal representation of males and females in the study, with males accounting for 49% of responses and female accounting for the remaining 51% of responses. The distribution of respondents based on gender is summarized in Table 4.1.

Table 4.2 Age distribution of respondents

Age	Frequency	Percent
Below 20 years	63	21.2
21 - 25 years	113	37.9
26 - 30 years	56	18.7
31 - 35 years	47	15.7
36 years and above	18	6.1
No response	1	0.5
Total	297	100.0

Source: Fieldwork 2020

Table 4.2 presents the age distribution of the respondents used for the study. From the responses it could be observed that the majority of the respondents fell under the 21 - 25 years (n=113, 37.9%) category, followed by respondents less than 20 years old (n=63, 21.2%). This indicates that the majority of the participants in the study were quite young. Participants who were older than 35 years accounted for only 6.1% of the total respondents. The results imply that the respondents were old enough to make worthy contributions to the conduct of the study.

Table 4.3 Level of Education of respondents

Level of Education	Frequency (<i>n</i>)	Percent (%)
Level 100	30	10.1
Level 200	53	17.7
Level 300	63	21.2
Level 400	48	16.2
Masters	99	33.3
PhD	4	1.5
Total	297	100.0

Source: Fieldwork 2020

Table 4.3 presents the summary of responses concerning the level of education of the respondents. The results show that the majority ($n=194$, 65.3%) of the respondents were undergraduate students (levels 100 to 400), with post-graduate students (Masters and PhD) accounting for the remaining 34.8% of the respondents. Masters level students contributed most to the data for the study (33.3%) of respondents, followed by Level 300 students with 21.2%. The least represented level of education were PhD students, who accounted for only 1.5% of the respondents.

Table 4.4 Descriptive Statistics on respondent's intentions to use MPS

Statements	N	Min.	Max.	Mean	±SD
If I have access to a mobile payment system, I intend to use it	297	1	5	4.75	.516
I intend to increase my use of mobile payment system in future	297	2	5	4.18	.772
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.4 presents the descriptive statistics on the respondent's intentions to use MPS. The results were assessed along a 5-point Likert scale where 1=strongly agree to 5=strongly agree. From the responses, it could be observed that the majority of the responses were towards the agreement end of the rating scale. The result further shows that most of the respondents (M=4.75, ±SD=.516) strongly agreed that they have access to a mobile payment system and they intend to use it. Additionally, the results show that most of the respondents (M=4.18, ±SD=.772) strongly agreed that they intend to increase their use of mobile payment system in future.

Table 4.5 Descriptive Statistics on attitudes towards use of MPS

Statement	N	Min.	Max	Mean	±SD
Mobile payment system would be a good idea to use	297	3	5	3.40	.685
Mobile payment system would be a wise idea to use	297	4	5	4.59	.492
Using a mobile payment system would be a pleasant experience	297	3	5	3.51	.575
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.5 presents the descriptive statistics on attitude towards the use of mobile payments systems. The results were assessed along a 5-point Likert scale where 1=strongly disagree to 5=strongly agree. From the results, it can be observed that the majority (M=4.59, ±SD=.492) of the respondents strongly agreed that mobile payment systems would be a wise idea to use. Also, most of the respondents (M=3.51, ±SD=.575) agreed that it will be a pleasant experience to use the mobile payment system whereas the majority of the respondents agreed that (M=3.40, ±SD=.685) the mobile payment system would be a good idea to use. From the responses, it can be concluded that tertiary students have a positive attitude towards the use of MPS.

Table 4.6 Descriptive Statistics on Trust in the use of MPS

Statement	N	Min	Max	Mean	±SD
Using a mobile payment system would be a pleasure	297	1	5	3.49	.966
Based on my experience I know that vendors selling MPs products/service are honest	297	1	5	3.65	.968
Based on my experience I know that vendors selling MPs products/service are opportunistic	297	2	5	3.95	.898
Based on my experience I know that vendors selling MPs products/service care about their customers	297	2	5	3.63	.936
Valid N (listwise)	297				

Source: Fieldwork 2020

The respondents were asked a series of questions on the extent to which they trust mobile payment systems. The results were summarised along a 5-point Likert scale where 1=strongly disagree to 5=strongly agree. That said the results as being portrayed in Table 4.6 show that the majority of the respondents agreed that (M=3.95, ±SD=.898) based on their experience they know that vendors selling MPs products/service are opportunistic; using a mobile payment system would be a pleasure (M=3.49, ±SD=.966), they know that vendors selling MPs products/service are honest (M=3.65, ±SD=.968) and also based on their experience they know that vendors selling MPs products/service care about their customers (M=3.63, ±SD=.936). The trend of the responses implies that tertiary students trust the current MPs available for their use.

Table 4.7 Descriptive Statistics perceived usefulness of the MPS

Statement	N	Min	Max	Mean	±SD
MPS products/services enhance my effectiveness	297	3	5	4.52	.602
Using MPS for my financial transactions is useful for me	297	2	5	3.95	.829
Using MPS as a support service to my transactions is good for my schedules.	297	2	5	3.91	.964
Using MPS products/services is easy	297	2	5	4.54	.755
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.7 presents the results concerning the perceived usefulness of the mobile payments systems available to the respondents. The results have been summarised along a 5-point Likert scale where 1=strongly disagree to 5=strongly agree. The higher the score the more respondents perceive the system to be useful. From the results, it could be seen that the majority of the respondents agreed that MPS products/services enhance my effectiveness (M=4.52, ±SD=.602), using MPS for my financial transactions is useful for me (M=3.95, ±SD=.829), using MPS as a support service to my transactions is good for my schedules (M=3.91, ±SD=.964) and using MPS products/services is easy (M=4.54, ±SD=.755). This shows that most of the responses were towards the agreement end of the rating scale suggesting that more the respondents have considered the available mobile payment systems to be useful.

Table 4.8 Descriptive Statistics on perceived ease of use

Statement	N	Min.	Max	Mean	±SD
Learning how to use MPS was easy	297	1	5	2.40	1.112
Using MPS to transact business has always been easy	297	2	5	3.91	.800
Valid N (listwise)	297				

Source: Fieldwork 2020

From Table 4.8, respondents were asked about the perceived ease of use of the mobile payment systems currently available. The results again summarized along a continuum of a 5-point Likert scale where 1=strongly disagree and 5=strongly agree. From the results, it can be observed that the majority of the respondents disagreed that learning how to use MPS is easy ($M=2.40$, $\pm SD=1.112$). However, the majority of the respondents agreed that they find the use of MPS in transacting business always been easy ($M=3.91$, $\pm SD=.800$).

From the trends of the responses, it could be concluded that tertiary students rather mobile payment systems difficult to learn but believe that the adoption of mobile payment systems has made their businesses easy to conduct.

Table 4.9 Descriptive Statistics on perceived joy of use

Statement	N	Min.	Max	Mean	±SD
I find the use of MPS for business transactions to be enjoyable	297	2	5	4.10	.699
Using MPS to effect transactions bring me some good feelings because there is no queue like at the bank	297	3	5	3.95	.375
I would have fun using MPS for business transactions	297	1	5	2.95	1.385
Valid N (listwise)	297				

Source: Fieldwork 2020

Concerning the perceived joy of use of the mobile payment systems the results as being shown in Table 4.9 shows that the majority of the respondents ($M=4.10$, $\pm SD=.699$) agreed strongly that they find the use of MPS for business transactions to be enjoyable; using MPS to effect transactions bring them some good feelings because there is no queue like at the bank ($M=3.95$, $\pm SD=.375$). On the contrary, the respondents disagreed that they have fun while using mobile payment systems for business transactions ($M=2.95$, $\pm SD=1.138$).

The trend of the results shows that the majority of the responses or ratings were towards the agreement end of the scale hence it could be concluded that respondents have some form of the positive perceived sense of joy relative to the use of MPS.

Table 4.10 Descriptive Statistics on perceived innovation

Statement	N	Min.	Max.	Mean	±SD
I am generally cautious about accepting new ideas.	297	2	5	3.55	1.090
I am challenged by ambiguities and unsolved problems.	297	1	5	3.39	1.419
There are sometimes network challenges with the use of MPS	297	2	5	3.87	.805
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.10 presents the descriptive statistics on the perceived innovation of the available mobile payment systems. Using a 5-point Likert scale where 1=strongly disagree to 5=strongly agree. The result shows that the majority of the respondents agreed that they are generally cautious about accepting new ideas (M=3.55, ±SD=1.090); challenged by ambiguities and unsolved problems (M=3.39, ±SD=1.419); and sometimes experience network challenges with the use of MPS (M=3.39, ±SD=1.419). From the results, it can be implied that most of the respondents are a bit cautious in their perceptions concerning the level of innovations of the currently available mobile payment systems.

Table 4.11 Descriptive Statistics on perceived subjective norms

Statement	N	Min.	Max.	Mean	±SD
People who influence my behaviour would think that I should use MPS for my transactions	297	2	5	4.29	.984
People who are important to me would think that I should use MPS for my transactions	297	2	5	3.84	.739
There is societal and business pressure to use MPS	297	4	5	4.64	.481
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.11 presents the descriptive statistics on responses concerning respondents' perceptions of the subjective norms of the use of mobile payment systems. A summary of the responses shows that the majority of the respondents strongly agreed that people who influence their behaviour would think that they should use mobile payment systems for their transactions (M=4.29, ±SD=.984) and also it is societal and business pressure to use MPS (M=4.64, ±SD=.481) whereas the majority of the respondents also agreed with the assertion that people who are important to me would think that I should use MPS for my transactions (M=3.84, ±SD=.739). From the responses, it could be concluded that tertiary students have high regard for the subjective norms associated with the use of mobile payment systems.

Table 4.12 Descriptive Statistics on perceived normative beliefs

Statement	N	Min.	Max.	Mean	±SD
My parents would think that I should use MPS for my transactions	297	3	5	4.69	.544
My batch-mates would think that I should use MPS for my transactions	297	3	5	4.50	.578
My friends would think that I should use MPS for my transactions	297	3	5	4.60	.569
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.12 presents the descriptive statistics on the perceived normative beliefs associated with the use of mobile payment systems. The results were measured along a 5-point Likert scale where 1=strongly disagree to 5=strongly agree. From the results it could be observed that the majority of the respondents strongly agreed that their parents would think that they should use MPS for my transactions (M=4.69, ±SD=.544), batch-mates would think that I should use MPS for my transactions (M=4.50, ±SD=.578) and friends would think that I should use MPS for my transactions (M=4.60, ±SD=.569).

From the results, one can conclude that the respondents hold a strongly agree and recognize the normative beliefs associated with the use of mobile payment systems.

Table 4.13 Descriptive Statistics on perceived behaviour control

Statement	N	Min.	Max.	Mean	±SD
Using MPS to purchase products/services is within my control.	297	3	5	4.56	.572
Given the resources, opportunities it takes to use mobile shopping, it would be easy for me to use the MPS	297	3	5	4.56	.573
Given the knowledge to use the system, it would be easy for me to use the MPS for transactions	297	3	5	4.44	.575
Valid N (listwise)	297				

Source: Fieldwork 2020

The researcher further sought to assess the perception of respondents regarding the behaviour control aspect that comes with the use of mobile payment systems. That notwithstanding responses to that effect is being shown in Table 4.13 where the results have been measured against a 5-point Likert scale. The result indicated that the majority of the respondents agreed strongly to the effect that using mobile payment systems to purchase products/services is within their control (M=4.56, ±SD=.572); given resources and opportunities it takes to use mobile shopping, it would be easy for me to use the MPS (M=4.60, ±SD=.573), given the knowledge to use the system, it would be easy for me to use the MPS for transactions (M=4.44, ±SD=.575).

From the responses, it could be inferred that the tertiary students acknowledge and accept that using MPS to purchase products/services is within their control, and also the students believe that it would be easy for them to use the mobile payment systems because of the resources and efforts that go into using the other methods. Additionally, given the knowledge to use the system, it would be easy for students to use the MPS for transactions.

Table 4.14 Descriptive Statistics on self-efficacy

Statement	N	Min.	Max.	Mean	±SD
I would feel comfortable in using MPS on my own.	297	3	5	4.38	.631
I would be able to use MPS for transactions even if there was no one around to show me how to.	297	2	5	4.13	.978
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.14 presents a summary of the responses on the self-efficacy relative to the use of mobile payment systems. The results show that the majority of the respondents were in strong agreement that they feel comfortable in using MPS on their own ($M=4.38, \pm SD=.631$) and that they would be able to use mobile payment systems for transactions even if there was no one around to show me how to do it ($M=4.13, \pm SD=.978$).

The results imply that the respondents rate themselves high enough to be able to use the available mobile payment systems on their own without any help. That is to conclude that they would feel comfortable in using the systems on their own and also able to initiate transactions on their own even if there was no one available to help them do so.

Table 4.15 Descriptive Statistics on challenges of MPS use

Statements	N	Min.	Max	Mean	±SD
I normally encounter network challenges when using the network	297	3	5	4.54	.574
It's easy to send money to the wrong person when the system	297	3	5	4.27	.526
I find the transactional charges too much	297	3	5	4.49	.575
Transaction takes too much time to complete	297	1	5	2.28	.875
Easy to be defrauded when using mobile money system	297	3	5	3.36	.627
The availability of a merchant close enough to your location at any point in time	297	1	5	2.32	.337
Forgetting your PIN	297	1	5	3.75	.827
The amount of money you can conveniently cash out from a merchant	297	1	5	3.21	.612
Valid N (listwise)	297				

Source: Fieldwork 2020

Table 4.15 presents respondents user experiences relative to the challenges they encounter with the use of mobile payment systems. The result shows that the majority of the respondents strongly agreed with the assertions that they normally encounter network challenges when using the mobile payment system ($M=4.54$, $\pm SD=.574$); that it is easy to send money to the wrong person when the system ($M=4.27$, $\pm SD=.526$) while they also find the transactional charges too much ($M=4.49$, $\pm SD=.575$).

Moreover, the result further showed that the respondents agreed that it is easy to be defrauded when using mobile payment systems ($M=3.36$, $\pm SD=.627$); forgetting your PIN ($M=3.75$, $\pm SD=.827$) and the amount of money you can conveniently cash out from a merchant ($M=3.21$, $\pm SD=.612$).

However, the respondents disagreed that transactions through mobile payment systems take too much time to complete ($M=2.28, \pm SD=.875$) and the availability of a merchant close enough to your location at any point in time ($M=2.32, \pm SD=.337$).

From the responses, it can be concluded that network challenges, easiness of sending money to the wrong person, too many transactional charges as well as a high probability of being defrauded while using the system, forgetting your PIN and the limitations on the amount one can conveniently cash out from a merchant are the major challenges confronting the use of mobile payment systems.



Table 4.16 Descriptive statistics of extracted variables research items

Variables	N	Skewness		Kurtosis	
		Stat	Std. Error	Stat	Std. Error
INTENT1	297	-1.498	0.173	1.047	0.344
INTENT2	297	-1.129	0.173	0.243	0.344
INTENT3	297	-1.418	0.173	0.948	0.344
INTENT4	297	-1.234	0.173	0.692	0.344
INTENT5	297	-0.467	0.173	-0.668	0.344
PU1	297	-0.934	0.173	-0.026	0.344
PU2	297	-1.295	0.174	0.671	0.346
PU3	297	-1.155	0.173	0.235	0.344
PEOU1	297	-1.217	0.174	0.408	0.346
PEOU2	297	-1.082	0.174	0.152	0.346
PEOU3	297	-0.902	0.175	-0.301	0.348
JOY1	297	-0.845	0.174	-0.300	0.346
JOY2	297	-0.962	0.173	-0.112	0.344
JOY3	297	-1.025	0.173	-0.075	0.344
INNOV1	297	-0.410	0.173	-1.297	0.345
INNOV2	297	-0.358	0.174	-1.180	0.346
INNOV3	297	-0.883	0.173	-0.552	0.344
SUBNOR1	297	-0.355	0.173	-1.099	0.344
SUBNOR2	297	-0.456	0.173	-1.026	0.344
SUBNOR3	297	-0.320	0.173	-1.200	0.345
PBC1	297	-0.926	0.174	-0.260	0.346
PBC2	297	-0.951	0.174	-0.271	0.346
PBC3	297	-1.186	0.174	0.394	0.346

Source: Fieldwork 2020

Even though PLS-SEM is very effective in handling non-normal data, the researcher still proceeded to explore the nature of the data for normality. Normality refers to “the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution” (Hair et al., 2010, p.71). The shape of the data was explored by checking for skewness and kurtosis as recommended (Hair et al., 2010). Skewness is indicative of whether

the distribution for the indicator is symmetrical or not, with positive coefficients skewness indicating that most of the values are below the mean and negative coefficient of skewness indicates the opposite.

Kurtosis, on the other hand, is a measure of the peakedness of the data, with positive coefficients of kurtosis indicating a peaked distribution and a negative coefficient of skewness indicating the opposite (Black, 2012; Kline, 1998). An absolute coefficient of skewness value of less than 3 and an absolute coefficient of kurtosis value of less than 5 have been recommended as indicative of normality of data (Kline, 1998; Hair et al., 2010). Table 4.17 presents the results from the summarized descriptive analysis of the research items and reveals that absolute coefficients skewness and kurtosis did not exceed 3 and 5 respectively as recommended.

4.3 Inferential Statistics

4.3.1 Measurement Model Results

The measurement model was analyzed by conducting the relevant tests and ensuring they meet the recommended specifications.

4.3.2 Convergent Validity

Convergent validity was assessed by assessing the psychometric properties of the research constructs (Cronbach's alpha, Composite reliability, rho_A, and Average Variance Extracted) and ensuring that they meet recommended thresholds (Hair et al., 2014).

Cronbach alpha measures the correlation among the indicators of a latent variable, and a benchmark of 0.7 and above is recommended (Chin, 1998; Hair et al., 2010). From Table 4.5, all constructs have Cronbach Alpha values greater than 0.7. Composite reliability, on the other

hand, measures the ability of the indicators to explain the variance of their latent variable, with a proposed benchmark of greater than 0.7 (Chin, 1998).

Again, reported in Table 4.17 indicates that all constructs have composite validities greater than 0.7. Average Variance Extracted (AVE) is the grand mean value of the squared loadings of a set of indicators and is equivalent to the commonality of a construct, with a recommended threshold of greater than 0.5 (Hair et al., 2014). All constructs meet this requirement as well as can be seen in Table 4.17. Finally, rho_A has recently emerged as an important reliability measure for PLS-SEM and is currently the only consistent reliability measure for PLS construct scores (Dijkstra and Henseler, 2015), with a minimum rho_A value of 0.7 recommended. Again, all constructs exceeded the recommended threshold as can be seen from Table 4.17.

Table 4.17 Psychometric properties of research constructs

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Perceived innovation (INNOV)	0.825	0.842	0.894	0.737
Intention to adopt MPS (INTENT)	0.915	0.918	0.940	0.796
Joy with Use of MPS (JOY)	0.908	0.908	0.956	0.916
Subjective Norms (NORM)	0.828	0.856	0.898	0.747
Perceived behavioral control (PBC)	0.890	0.894	0.932	0.820
Perceived Ease of Use (PEOU)	0.895	0.897	0.950	0.905
Perceived Usefulness (PU)	0.924	0.928	0.952	0.868

Source: Fieldwork 2020

Additionally, for there to be convergent validity, all items must load highly on their constructs (Hair et al., 2014). There were some items with either low loadings or high cross-loadings (INTENT5, PEOU3, and JOY3). These items were dropped from further analyses as recommended (Hair et al., 2014). As can be seen from Table 4.18 below, the remaining items

had loadings greater than 0.7 as recommended (Hair et al., 2014). Hence it is concluded that the research model possesses adequate convergent validity.

4.7.4 Discriminant Validity

Table 4.18 Fornell-Larcker criterion

	INNOV	INTENT	JOY	NORM	PBC	PEOU	PU
INNOV	0.859						
INTENT	0.483	0.892					
JOY	0.478	0.655	0.957				
NORM	0.640	0.402	0.566	0.864			
PBC	0.551	0.593	0.617	0.554	0.906		
PEOU	0.462	0.693	0.692	0.383	0.685	0.951	
PU	0.508	0.729	0.773	0.544	0.673	0.765	0.932

Source: Fieldwork 2020

Discriminant validity ensures that a constructed measure is empirically unique and represents phenomena of interest that other measures in a structural equation model do not capture (Hair et al. 2010). Discriminant validity was assessed using three techniques; (i) the Fornell-Larcker criterion, (ii) item cross-loadings, and (iii) heterotrait-monotrait ratio of correlations (HTMT).

The Fornell-Larcker criterion indicates that there is discriminant validity when the squared root of the AVE of a factor is greater than its correlation with all other factors in the model (Fornell and Larcker, 1981).

In Table 4.18, the diagonal values in bold represent the square root of the AVE of the construct, whilst off-diagonal values represent interrelation among constructs. Again, the table shows that all diagonal variables are greater than off-diagonal values, confirming the discriminant validity of the model.

Table 4.19 Cross loadings of research items

	INNOV	INTENT	JOY	PBC	PEOU	PU	NORM
INNOV1	0.853	0.376	0.370	0.417	0.397	0.398	0.527
INNOV2	0.862	0.362	0.381	0.429	0.304	0.376	0.564
INNOV3	0.862	0.484	0.465	0.550	0.466	0.511	0.556
INTENT1	0.426	0.870	0.599	0.520	0.589	0.593	0.353
INTENT2	0.365	0.887	0.569	0.503	0.598	0.642	0.354
INTENT3	0.442	0.892	0.559	0.505	0.584	0.657	0.336
INTENT4	0.484	0.919	0.609	0.584	0.695	0.706	0.388
JOY1	0.425	0.623	0.957	0.551	0.619	0.727	0.534
JOY2	0.489	0.630	0.957	0.629	0.705	0.751	0.550
PBC1	0.490	0.503	0.510	0.888	0.655	0.620	0.473
PBC2	0.497	0.563	0.605	0.928	0.658	0.649	0.524
PBC3	0.511	0.543	0.557	0.900	0.549	0.559	0.506
PEOU1	0.474	0.676	0.675	0.676	0.954	0.794	0.413
PEOU2	0.402	0.642	0.640	0.626	0.949	0.659	0.313
PU1	0.469	0.643	0.721	0.576	0.644	0.912	0.513
PU2	0.478	0.723	0.712	0.652	0.758	0.952	0.508
PU3	0.473	0.669	0.728	0.649	0.731	0.931	0.499
SUBNOR1	0.562	0.356	0.532	0.530	0.348	0.520	0.928
SUBNOR2	0.553	0.391	0.528	0.506	0.336	0.486	0.908
SUBNOR3	0.556	0.283	0.395	0.388	0.310	0.398	0.745

Source: Fieldwork 2020

Next, the cross-loading technique in Table 4.19 suggests that there is discriminant validity when no research item loads higher on other constructs than their own constructs (Hair et al., 2014; Barclay et al., 1995). All items with high cross-loadings were dropped as recommended (Hair et al., 2012). After dropping items, all measurement items loaded higher on their own constructs than against other constructs, confirming discriminant validity of the research model as can be seen in Table 4.19.

Finally, the discriminant validity was assessed using the HTMT test. HTMT is the average of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena), relative to the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct) (Henseler et al, 2015). HTMT test approach indicates that HTMT values must be significantly less than 1, with a value of less than 0.85 ideal (Henseler et al, 2015). Table 4.20 indicates that the highest HTMT value is 0.844, confirming the model possesses adequate discriminant validity.

Test of Hypothesis

There is no significant difference between the perception of a student with regard to the uses of the mobile system among male and female student

Independent Sample T-Test

The independent sample t-test also called the two-sample t-test, independent-samples t-test or student's t-test, is an inferential statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups. This seeks to test that the population means from the two unrelated groups are equal;

H₀: $\mu_1 = \mu_2$

Table 4.20 Group Statistics for hypothesis 1

Gender	N	Mean	±SD	Std. Error Mean
Male	152	4.19	.743	.060
Female	145	4.62	.540	.044

Source: Fieldwork (2020)

From the group statistics presented in Table 4.20, it could be observed that the males ($M=4.19$, $\pm SD=.743$) attained a higher mean score than their females ($M=4.62$, $\pm SD=.540$) counterparts.

The results show the observed mean differences between males and females regarding their perceptions on the use of mobile payment systems.

Table 4.21 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Perceptions on the use of MPS	Equal variances assumed	13.759	.000	-5.731	298	.000	-.431	.075	-.579	-.283
	Equal variances not assumed			-5.755	275.704	.000	-.431	.075	-.578	-.283

Source: Fieldwork (2020)

Table 4.21 presents the Levene's Test for equality of variances which tests the homogeneity of variances among the two groups. From the results, it could be observed that the test was not significant ($F=13.759$, $p<.05$) showing equal variances among the two groups.

From the independent sample t-tests run at 95% confidence interval (CI) for the mean difference. The results further show that the perceptions of males were statistically significant from those of the female ($t(298)=5.755$, $p=.001$). From the results, we can then reject the null hypothesis that there is no significant difference between the perception of a student with regard to the uses of the mobile system among male and female student.

Hypothesis Two

There is no significant difference in challenge among the male and female student in using the mobile payment system

Table 4.22 Group Statistics

	Gender	N	Mean	±SD	Std. Error Mean
Challenges with MPS use	Male	152	4.4762	.54262	.04401
	Female	145	4.2703	.29597	.02433

Source: Fieldwork (2020)

Table 4.22 presents the group statistics showing the mean differences between males and females on the challenges associated with the use of mobile payment systems. From the results, it could be seen that the males (M=4.476, ±SD=.543) attained a high mean score than the females (M=4.270, ±SD=.296) indicating mean differences in the ratings of the respondents on the challenges with the use of mobile payment systems.

Table 4.23 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Challenges with MPS use	Equal variances assumed	27.594	.000	4.064	298	.000	.20588	.05065	.10620	.30557
	Equal variances not assumed			4.094	234.849	.000	.20588	.05029	.10681	.30496

Source: Fieldwork (2020)

Table 4.23 presents the Levene's Test for equality of variances which tests the homogeneity of variances among the two groups. From the results, it could be observed that the test was not significant ($F=.314$, $p>.05$) which points to the direction that the data being used for the analysis shows equal variances among the two groups hence suitable for further analysis.

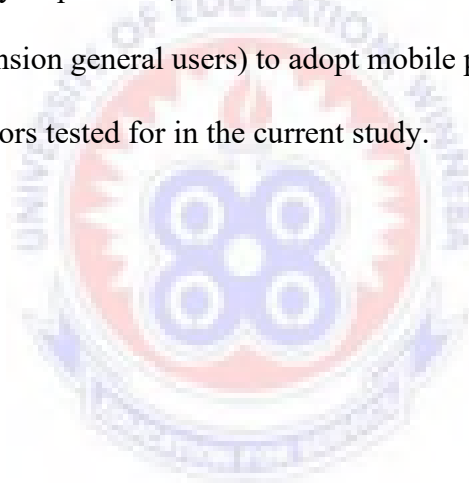
Therefore, an independent t-test was run on the data with a 95% confidence interval (CI) for the mean difference. The results further show that the perceptions of males regarding the challenges associated with the use of mobile payment systems were statistically significantly different from those of the females ($t=298$; $df=4.094$; $p=.001$). From the results, we can then reject the null hypothesis that there are no significant differences in a challenge among the male and female student in using the mobile payment system.

From the results, it could be concluded that there is a statistically significant difference in the perceptions of males on the challenges associated with the use of mobile payment systems.

4.4 Discussions

The key findings are discussed based on the objectives of the study as well as research questions clearly outlined in chapter one. The study sought to investigate mobile payment usage among tertiary students in Ghana. Specifically, the study sought to investigate the influence of seven independent (explanatory) variables on the intention of student to adopt the use of mobile payment systems among tertiary students. More so, their perception in relation to the use of such systems. The study revealed that the hypothesized assertions were statistically significant; hence the assertions were rejected denoting that there was is a statistically significant difference in the males and females' perceptions regarding the use of mobile payment systems and the challenges associated with the use of mobile payment systems.

The findings of the study revealed that factors that had a significant influence on the intention of tertiary students to adopt the use mobile payment platforms were attitude and trust (AT), perceived ease of use (PEOU), perceived usefulness (PU), and the level of joy in use (JOY). The findings of the study are consistent with extant literature (Tobbin and Kowornu, 2011; Osei-Assibey, 2014). The findings of the study imply that among other things, the intention of tertiary students to adopt the use of mobile payment platforms is influenced by the user-friendliness of the platform, the satisfaction derived from the use, the reliability and safety of the system as well as the benefit expected to be derived from it. In the context of the study, the four drivers, AT, PU, PEOU, JOY accounted for 60% of the variance in the intention to use mobile payment systems. By implication, about 60% of the factors that affect the intention of tertiary students (or by extension general users) to adopt mobile payment platforms or systems are explained by the predictors tested for in the current study.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study aimed to explore mobile payment system adoption among tertiary students in Ghana to gain an understanding of their perceptions regarding the subject. The aim was met by following the objectives set before conducting the research, which is to determine the factors that influence the usage of mobile payment system among tertiary students in Ghana and to examine the perception of tertiary students relative to the adoption of mobile payment systems in Ghana as well as assess the challenges associated with same. The current chapter provides a summary of findings, conclusions and offers some recommendations.

5.2 Summary of Findings

The study discovered that tertiary students demonstrate strong intentions to use mobile payment systems and that they have a positive attitude towards the use of MPS. Furthermore, tertiary students trust the current mobile payment systems available for use. They also find available mobile payment systems to be useful.

Furthermore, the study found that tertiary students rather mobile payment systems difficult to learn but believe that the adoption of mobile payment systems have made their businesses easy to conduct and that they find the joy in the use of the mobile payment systems.

Additionally, the study observed that have positive perceptions concerning the level of innovations of the currently available mobile payment systems while also establishing that tertiary students recognise the normative beliefs associated with the use of mobile payment systems.

Moreover, the study discovered that tertiary students acknowledge and accept that using MPS to purchase products/services is within their control, and also the students believe that it would be easy for them to use the mobile payment systems because of the resources and efforts that go into using the other methods and that given the knowledge to use the system, it would be easy for students to use the MPS for transactions. The study further revealed that tertiary students feel comfortable in using the systems on their own and also able to initiate transactions on their own even if there was no one available to help them do so.

Concerning challenges associated with the use of mobile payment system, the study noted that network challenges, easiness of sending money to the wrong person, too many transactional charges as well as a high probability of being defrauded while using the system, forgetting your PIN and the limitations on the amount one can conveniently cash out from a merchant are the major challenges confronting the use of mobile payment systems.

It was found that there is indeed a significant difference between the perception of the student about the uses of the mobile system among male and female student. Also, the study observed statistically significant differences in the perceptions of males on the challenges associated with the use of mobile payment systems.

5.3 Conclusions

The study sought to investigate mobile payment adoption among tertiary students in Ghana. Specifically, the study sought to investigate the influence of seven independent (explanatory) variables on the intention of students to adopt the use of mobile payment systems. More so, their perception of the use of such systems. The study revealed that four of the hypothesized associations were significant and positive while the remaining three were not significant. The findings of the study imply that among other things, the intention of tertiary students to adopt

the use of mobile payment platforms is influenced by the user-friendliness of the platform, the satisfaction derived from the use, the reliability and safety of the system as well as the benefit expected to be derived from it. In the context of the study, the four drivers, AT, PU, PEOU, JOY accounted for 63.7% of the variance in the intention to use mobile payment systems. By implication, about 64% of the factors that affect the intention of tertiary students (or by extension general users) to adopt mobile payment platforms or systems are explained by the predictors tested for in the current study.

Concerning challenges associated with the use of mobile payment system, the study noted that network challenges, easiness of sending money to the wrong person, too many transactional charges as well as a high probability of being defrauded while using the system, forgetting your PIN and the limitations on the amount one can conveniently cash out from a merchant are the major challenges confronting the use of mobile payment systems.

There is a significant difference between the perception of the student concerning the uses of the mobile system among male and female student. Also, the study observed statistically significant differences in the perceptions of males on the challenges associated with the use of mobile payment systems.

5.4 Recommendations

Based on the findings, the ensuing recommendations are made:

1. It is recommended that mobile companies in Ghana invest massively in mobile payment systems and other information technology innovations; this will assist in enhancing the adoption rate.

2. Again, there is a need to extensively educate students on the use of mobile payment systems to facilitate easy adoption and smooth usage of the service.
3. The benefit of educating students regarding mobile payment systems and services is that the knowledge of the system will be readily available to the students and most significantly the level of understanding will be high compared to the current situation. It can also help in reducing the resistance to the service use
4. Furthermore, it is recommended that the various mobile payment service providers in should strive address promptly the challenges students faced by students while using the service to ensure that the services students feel safe and secured while using the service.
5. Students should be encouraged to reduce the amount of physical cash on them at any point in time since a cashless system primarily makes it safe for people to go about their activities without thinking of their money collaboration.

5.5 Suggestions for Further Research

Due to the limitations of this study, further research can be conducted in specific areas about the usage behaviour of people when it comes to mobile payment systems.

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APPENDIX I

QUESTIONNAIRES FOR STUDENTS

PURPOSE

This questionnaire is designed to collect relevant information about your views concerning mobile payment system usage among tertiary students in the Kumasi Metropolis. Your response to these set of items will remain confidential, and the results will be used to tertiary student's tendencies when it comes to the application or the adoption of mobile payment system. We hope you will be able to take time and carefully complete this questionnaire. You can use a \surd mark to indicate your responses for items with alternative responses on a 5-point likert scale of 1= strongly disagree, 2= disagree, 3=not sure, 4= agree and 5=strongly agree.

Thank you for your time

The Researcher



SECTION A: Demographics

1. Institution _____
2. Gender: Male [] Female []
3. Age: Below 20 [] 21-25 [] 26-30 [] 31-35 [] 36 & above []
4. Academic year of study: 100 [] 200 [] 300 [] 400 [] Masters [] PhD []
5. Department _____
6. Which network do you use for the mobile money _____
7. Which functions do you mostly use your mobile money application for?
 Transfer Money [] Pay bills [] Online purchase []
 Top-up credits/internet bundle [] All the above []
 Other (specify)

SECTION B: INTENSIONS, ATTITUDE and TRUST

	<i>To what extent do you agree with your intentions to use mobile payment systems</i>	<i>Strongly disagree</i> 1	2	3	4	5 <i>Strongly agree</i>
Intensions						
1	If I have access to a mobile payment system, I intend to use it					
2	I intend to increase my use of mobile payment systems in future					
Attitude						
3	Mobile payment systems would be a good idea to use.					
4	Mobile payment systems would be a wise idea to use					
5	Using a mobile payment system would be a pleasant experience					
Trust						
1	Using a mobile payment system would be a pleasant experience					
2	Based on my experience, I know that vendors selling MPS products/services are honest					
3	Based on my experience, I know that vendors selling MPS products/services are opportunistic.					
4	Based on my experience, I know that vendors selling MPS products/					

services care about their customers.						
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SECTION C: PERCEIVED USEFULNESS (PU), EASE OF USE (PEOU) and JOY WITH USE OF MPS

	<i>To what extent do you agree with how you perceive the MPS to be useful</i>	<i>Strongly disagree</i> 1	2	3	4	5 Strongly agree
Perceived Usefulness (PU)						
1	MPS products/services enhance my effectiveness					
2	Using MPS for my financial transactions is useful for me					
3	Using MPS as a support service to my transactions is good for my schedules.					
Perceived Ease of Use (PEOU)						
1	Using MPS products/services is easy					
2	Learning how to use MPS was easy					
3	Using MPS to transact business has always been easy					
Joy with Use of MPS						
1	I would have fun using MPS for business transactions					
2	I find the use of MPS for business transactions to be enjoyable					
3	Using MPS to effect transactions bring me some good feelings because there is no queue like at the bank					

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

SECTION D: PERCEIVED INNOVATION, SUBJECTIVE NORMS, and NORMATIVE BELIEFS WITH THE USE OF MPS

	<i>To what extent do you agree with the following statements</i>	<i>Strongly disagree</i> 1	2	3	4	5 Strongly agree

Perceived innovation						
1	I am generally cautious about accepting new ideas.					
2	I am challenged by ambiguities and unsolved problems.					
3	There are sometimes network challenges with the use of MPS					
Subjective Norms						
1	People who influence my behaviour would think that I should use MPS for my transactions					
2	People who are important to me would think that I should use MPS for my transactions					
3	There is societal and business pressure to use MPS					
Normative beliefs with use						
1	My parents would think that I should use MPS for my transactions					
2	My batch-mates would think that I should use MPS for my transactions					
3	My friends would think that I should use MPS for my transactions					

SECTION E: PERCEIVED BEHAVIOURAL CONTROL and SELF EFFICACY

	<i>To what extent do you agree with the following statements</i>	<i>Strongly disagree</i> 1	2	3	4	<i>Strongly agree</i> 5
Perceived behavioral control						
1	Using MPS to purchase products/services is within my control.					
2	Given the resources, opportunities it takes to use mobile shopping, it would be easy for me to use the MPS					

3	Given the knowledge to use the system, it would be easy for me to use the MPS for transactions					
Self-Efficacy						
1	I would feel comfortable in using MPS on my own.					
2	I would be able to use MPS for transactions even if there was no one around to show me how to.					

SECTION F: CHALLENGES WITH THE USE OF MOBILE MONEY SYSTEM

	<i>To what extent do you agree with the following statements</i>	<i>Strongly disagree</i> 1	2	3	4	5Strongly agree
1	I normally encounter network challenges when using the network					
2	It's easy to send money to the wrong person when the system					
3	I find the transactional charges too much					
4	Transaction takes too much time to complete					
5	Easy to be defrauded when using mobile money system					
6	The availability of a merchant close enough to your location at any point in time					
7	Forgetting your PIN					
8	The amount of money you can conveniently cash out from a merchant					

APPENDIX II

SAMPLE DETERMINATION TABLE

Table for determining sample size from a given population

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	100000	384

Note. —N is population size, S= Sample size

Source: Krejcie, R.V. & Morgan, D.W. (1970)