M-GOVERNANCE SERVICES ADOPTION BY HIGHER EDUCATION INSTITUTIONS: CASE OF NORTH CYPRUS UNIVERSITIES

A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF APPLIED SCIENCES OF NEAR EAST UNIVERSITY

By

ALAA AHMED MOHAMMED

In Partial Fulfillment of the Requirements for the Degree of Master of Science in Computer Information Systems

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Alaa Ahmed Mohammed
Signature:
Date:

To my lovely family...

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ABSTRACT

The vast changes that are occurring in the technological sector are causing governments and educational institutions all over the world to consider re-designing the educational system to incorporate such changes. M-governance involves the government delivering information to its citizens through the usage of electronic mobile services such as SMS or making it available on the web.

As a result of economic upheaval in North Cyprus, lack of public awareness has been a major hindrance to m-governance adoption among citizens. To fully understand the slow adoption rate, the researcher investigated the challenges and prospects of m-governance adoption in Higher Education. A survey was conducted at four universities in North Cyprus. Out of the 400 questionnaires distributed, 341 were collected and the data was analyzed using descriptive statistics, independent t-test and ANOVA. The mean was ranked from the highest to the least respectively in this order, Performance Expectancy, Perceived Public Value, Facilitating Conditions, Social Influence, Trust in Mobile Technology, Perceived good Government and Less Corruption, Trust in Government and the least to be ranked was Effort Expectancy.

Research findings also showed that there was no significant difference between gender and all dependent variables (UTAUT, Trustworthiness, Perceived Good Government and Less Corruption and Perceived Public Value). There was no significant difference between level of study and all dependent variables. Furthermore, there was no significant difference between age and three dependent variables (UTAUT, Trustworthiness and Perceived Good Governance and Less Corruption).

There was a significant difference between age and perceived public value mainly between the two age groups (18-22 and 28 and above) this suggests that as people mature in age they tend to perceive more benefits and become more knowledgeable of m-governance services at their disposal. Not much research has been done on the adoption of m-governance services in North Cyprus, therefore the researcher hopes that this study will be beneficial to various educational stakeholders in fully understanding the benefits and challenges of m-governance adoption.

Keywords: Adoption, higher education, m-governance, TAM, UTAUT

ÖZET

Eğitim sektöründeki hızlı teknolojik gelişmeler, hükümetleri, kurumları ve eğitim sektörünü yeniden tasarlamayı düşünmeye zorlamaktadır. M-devlet, SMS gibi elektronik mobil hizmetlerin kullanımı yoluyla vatandaşlarına bilgi sağlaması ya da web üzerinden erişilebilir hale getirilmesini içerir.

Ekonomik istikrarsızlıktan dolayı, Kuzey Kıbrıs, m-yönetişim projelerinin yürütülmesinde esasen beyin göçü ve vatandaşlar arasında m-yönetişim kullanımının faydaları konusunda halkın bilinç eksikliği yüzünden zorluklarla karşı karşıya bulunmaktadır. Bu nedenle, bu çalışmanın amacı, m-yönetişim alanının Yüksek Öğrenimde benimsenmesinin zorluklarını ve umutlarını araştırmak ve anlamaktır. Bu amaçla

Kuzey Kıbrıs'taki dört üniversite öğrencilerinin katıldığı bir anket yapıldı. Dağıtılan 400 anketin 341'i toplanmış ve veriler betimsel istatistikler, bağımsız t-testi ve ANOVA kullanılarak analiz edilmiştir. Ortalama, en yüksekten en düşüğe doğru şu şekilde sıralanmıştır: Performans Beklentisi, Algılanan Kamu Değeri, Kolaylaştırıcı Koşullar, Sosyal Etki, Mobil Teknolojiye Güven, Algılanan İyi Hükümet ve Daha Az Yolsuzluk, Hükümete Güven ve en düişük değer Çaba Beklentisi olarak görülmüştür.

Sonuçlar, bağımsız değişkenler (yaş, çalışma düzeyi ve cinsiyet) ile bağımlı değişkenler (UTAUT, Güvenilirlik ve Algılanan İyi Hükümet, Daha Az Yolsuzluk ve Algılanan Kamu Değeri) arasında anlamlı bir farklılığın olmadığını göstermiştir.

Bununla birlikte, yaş ile algılanan kamu değeri arasında önemli bir fark olduğu görülmüştür. Iki yaş grubu (18-22 ve 28 ve üzeri) arasında yaş ile Algılanan Kamu Değeri için önemli bir farklılık görülmüştür. Bu, yaşlandıkça insanlar olgunlaştıkça daha fazla fayda görme eğiliminde olduklarını ve m-yönetişim hizmetleri konusunda daha bilgili olma eğiliminde olduklarını ortaya koymaktadır. Kuzey Kıbrıs'ta m-yönetişim hizmetlerinin kabul edilmesine ilişkin çok fazla araştırma yapılmadığı için araştırmacı, bu çalışmanın, m-yönetişim alanının benimsenmesinin yararlarını ve zorluklarını tam olarak anlamada çeşitli eğitim paydaşlarına faydalı olacağını düşünmektedir.

***Anahtar Kelimeler*:** M-devlet, TAM, UTAUT, uyarlama, yüksek öğretim,

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LIST OF ABBREVIATIONS

IT- Information Technology

ISP Internet Service Providers

NGO- Non Governmental Organization

SMS- Short Message Service

TAM- Technology Acceptance Model

UTAUT- Unified Theory of Acceptance and Use of Technology (UTAUT).

WAP- Wireless Application Protocol.

CHAPTER 1

INTRODUCTION

This chapter contains the problem statement, aim of the study, why the study is deemed important, the research questions and a general description of the chapters contained in this thesis.

Background

E-government systems are marking a drastic change in the way services are rendered to citizens and the overall way in which different stakeholders in the educational sector engage each other. In the literature (Shaikh & Kasat, 2009) defined e-government as an electronic means whereby the government uses ICT (Information Communication Technologies) services to engage the public and provide various services to its citizens. On the other hand, the following researchers, (Shaikh & Kasat, 2009; Suklabaidya & Sen, 2013; Batta et al., 2011) have defined m-governance as using mobile devices to access government services through electronic means such as SMS, WAP or through a website.

Various m-governance services are used in the educational sector by the various stakeholders involved, these include:

- General information which includes information relating to weather forecast, safety information, tourist attraction places and recreation places.
- Particular information relating to latest information on money exchange rates, stock exchange rates, examination results and program news for events happening in the area.
- Crisis or emergency alerts such as roads closed due to accidents or severe weather updates in specific areas.
- General SMS notifications regarding library deadlines for submitting borrowed books, the release of examination results, exam grades and university admission process.

The availability of smartphones has led to a trend on handling e-government services via smartphones. Therefore, at this stage, it is important to identify education stakeholders' views about m-governance services adoption.

1.1 Problem Statement

North Cyprus has been facing challenges in executing m-governance projects due to lack of public awareness. For this reason it is important to identify the views of stakeholders about m-governance services adoption. To find out about this, we will measure students trust in mobile technology, performance expectancy, trust in government, effort expectancy, perceived public value, social influence and perceived good governance and less corruption.

1.2 Aim of the Study

The central point behind this study is investigating m-governance services adoption in north Cyprus universities

To fully understand the aim of the study, the researcher examined the following research:

1. What are the university students' attitude on m-governance services adoption?
2. Is there any significant difference with respect to gender on:
    a. Trustworthiness?
    b. Perceived good government and less corruption?
    c. Perceived public value?
    d. UTAUT?
3. Is there any significant difference with respect to age on:
    a. Trustworthiness?
    b. Perceived good government and less corruption?
    c. Perceived public value?
    d. UTAUT?
4. Is there any significant difference with respect to level of study on:
    a. Trustworthiness?
    b. Perceived good government and less corruption?
    c. Perceived public value?
    d. UTAUT?

1.3 Importance of Study

The study on m-governance adoption in North Cyprus is deemed important to different educational stakeholders which include researchers interested in the same field of study, academic institutions, overall government sector, government policy makers, students and the citizens of North Cyprus.

I. Academic Institutions (Universities in North Cyprus)

- The adoption of m-governance services in the educational sector in Northern Cyprus will allow various stakeholders and regulatory bodies to operate efficiently and effectively in real time maintaining quality output in all their operations (Garg et al., 2011).
- Batta et al. (2011) by using m-governance services academic institutions are able to reach out a larger market through the internet hence promoting institutional awareness and making communication with future prospective students easier.
- M-governance allows government regulatory bodies to monitor institutions more effectively and at a central level which promotes constant feedback (Garg et al., 2011).
- Kapoor and Kelkar (2013) pointed out that by adopting m-governance services, shareholders it promotes e-participation whereby all individuals can interact virtually and share ideas without having to travel and meet at a central point.
- By adapting to m-governance, the overall educational sector improves due to an increased level of transparency between various stakeholders and corruption is minimized.

II. Government

- Suklabaidya and Sen (2013) described the adoption of m-governance as an effective step which eventually leads to increased levels of transparency and improved provision of services to the citizens.
- Suklabaidya and Sen (2013) alluded that proper implementation of m-governance services promotes a more pro-active decision making lifestyle within the government rather than a reactive style.

III. Students

- Students can easily engage their lecturers using m-governance services and the learning process is made easier as students can easily access study resources online and participate virtually in class discussions (Kapoor & Kelkar, 2013).
- Kapoor and Kelkar (2013) explained that adoption of m-governance services will allow students to manage their own portal virtually and interact with other stakeholders online and have access to information regarding exam dates and results at a click of a button.

IV. Overall Educational System

- As alluded by previous researchers (Nkwe,2012; Kapoor & Kelkar, 2013 ;Garg et al., 2011; Alhomod, 2013) various educational stakeholders are empowered through the use of m-governance services which increases transparency and has a positive impact on individual academic institutions which can lure more students hence promoting overall growth and awareness

V. Researchers

- The adoption of m-governance services in North Cyprus has not been under study by many researchers and the high penetration of mobile devices in the country is attracting many researchers to find out how mobile devices can be used in the educational sector. By so doing this study will be beneficial to researchers who are interested in m-governance adoption.

1.4 Limitations of the Study

- The researcher focused his study on students currently enrolled at 4 universities in North Cyprus (Girne American University, Near East University, Cyprus International University and Eastern Mediterranean University) with the population consisting of students from 5 departments (Computer Engineering, Information Technology, Management Information Systems, Computer Information Systems and Computer Technologies and programming).

- The research was conducted over a short period of time during the fall semester of the 2016 academic year. Further research is recommended that can be conducted over a longitudinal time frame to fully understand the challenges and prospects of the adoption of m-governance in higher educational institutions in North Cyprus.

1.5 Overview of the Thesis

The thesis is divided into distinct chapters which are explained in detail below:

Chapter One: Overview

The chapter explains a brief introduction to the study under question. It goes further to give a detailed explanation of the problem statement, the main aim or focus of the study, why the study is important, research questions and a summary of other chapters that follow.

Chapter Two: Literature review

In this section of the thesis, the researcher seeks to find related research that has been conducted by other researchers and explains m-governance in detail paying attention to previous research findings, prospects of m-governance adoption, what has been done thus far and challenges and factors that hinder effective adoption.

Chapter Three: Theoretical Framework

In this section of the study, the researcher gives a detailed explanation of the different components of m-governance, models for successful adoption of m-governance in the educational sector, key steps that result in effective implementation and the advantages of adapting m-governance in higher educational institutions.

Chapter Four: Research Methodology.

In this section of the study, the researcher describes the model that was used in the study, demographic data of the participants, the data collection tool used for data collection, analysis method used to analyze and interpret the results, Gantt chart of the study together with the steps taken in conducting the study and the reliability test for each dimension on the survey.

Chapter Five: Results and Discussion

In this section of the study, the researcher gives a detailed explanation of the research findings he found and compares the results with those of previous researchers before drawing a conclusion based on the similarity of results or differences.

Chapter Six: Conclusions and Recommendations

To sum-up all research findings explained in the previous chapters, the researcher now gives his final say on the topic and states recommendations which he proposes for future studies to be undertaken.

CHAPTER 2

RELATED RESEARCH

In this section of the thesis, the researcher seeks to find related research that has been conducted by other researchers and explains m-governance in detail paying attention to previous research findings, prospects of m-governance adoption, what has been done thus far and challenges and factors that hinder effective adoption.

2.1 M-governance in Education

Garg et al. (2011) explained that the massive penetration of mobile devices in different countries has alarmed governments in considering m-governance adoption as this will help in effectively communicating with various stakeholders in the educational sector. Educational stakeholders will be able to communicate at a central level and virtually and this will promote efficiency within the government and in academic institutions. This section will explain the current status-quo of m-governance services in North Cyprus and what the government proposes in future.

2.1.1 M-governance adoption at national level

Rahim and Athmay (2013) gave a detailed description of the current status-quo of m-governance projects adapted in North Cyprus. The researcher goes on to say that it is the responsibility of academic institutions and the government to see that m-governance adoption is successfully done and that all educational stakeholders are fully aware of the benefits from adapting to m-governance. Furthermore, researchers stated that it is compulsory for all academic institutions in North Cyprus to partner with the government in implementing this technology.

The usage of ICT (Information Communication Technologies) as part of m-governance adoption requires secure systems to be put in place to safeguard users and promote the system from unauthorized users such as hackers. Suklabaidya and Sen (2013) also pointed out that the government is willing to conduct awareness programs so that all educational stakeholders are at par on the benefits if using this highly demanded technology in the educational sector.

2.1.2 Institute level

Mohammed and Seifedine (2013) explained that the government of Turkish Republic of North Cyprus has signed contracts with different academic institutions on promoting m-governance adoption as well as establishing low level m-governance projects at institutional level aimed at promoting awareness of m-governance services at the institution.

Positive feedback from m-governance projects have been reported at a steady rate during the past 4 years in North Cyprus (Suklabaidya & Sen, 2013). A high response rate have been recorded to be among private owned educational institutions such as, Girne American University and Eastern Mediterranean University which have in-cooperated the SMS notification system into their learning system. Students are notified via email and SMS once their results are published and important registration dates. Furthermore the researchers explained that most private and government institutions have started implementing Integrated Institute Management System (IIMS) that support m-governance service adoption.

Jabbar et al. (2013) indicated that primary schools and colleges are in the process of implementing m-governance services at institutional level which encourage involvement of all stakeholders at various levels, parents can be updated on their children's performance through SMS's sent directly from the institution, this ensures that all members are up to date with current news and events being done at the institution which promotes e-participation.

2.1.3 International perspective

India has been ranked as one of the world's best countries that have had successful implementation of m-governance services through the introduction of its M-star educational expert system which has had a high turn up rate among higher educational institutions in the country (Batta et al, 2011). Furthermore, the researchers explained the system as having various functionalities at the disposal of academic institutions such as automated registration, exam grading and employee performance appraisal and analysis.

Rizvi (2016) also explained another outstanding m-governance project in India known as Project Vidya-vahini which was sponsored by a non-profit organization and gained acceptance from the public in a short period of time. The main aim is equipping students and educational institutions with ICT infrastructure with a main focus in rural areas to curd digital divide.

In Botswana m-governance projects started by the provision of grants to less privileged students to enable them to be educated on the usage of ICT services as well giving laptops to students and installing fiber-optic cables across the nations for faster internet services (Nkwe, 2012). The ministry of education has been conducting workshops and seminars across the nation to alert the citizens of the benefits of adopting to m-governance by stressing other benefits such as paying electric and water bills over the internet using your mobile device.

Seddiky and Ara (2015) explained the current status quo of m-governance adoption in Bangladesh as having had a positive response from the citizens. The researchers alluded that, 48% of citizens mentioned that the adoption of m-governance services has reduced corruption in both the government and educational sector. In addition to that, the researchers also mentioned that the overall quality of services rendered to the public and its transparency has improved by 36% within 2 years since the adoption of the service.

2.2 Adoption and usage of IT Models

In the literature, many researchers (Alkhatib, 2013; Nkwe, 2012; Jabbar et al., 2013) have explained several models and theories which have been developed to understand why individuals accept or reject new technology. In this study, we shall review the Unified Theory of Acceptance and Use of Technology (UTAUT). Alkhatib (2013) defines UTAUT as a complete model that combines what is currently known thereby providing a basis to guide future research in the same area of study.

2.2.1 The Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT model consists of eight components which are grouped into three categories. The first category consists of three indirect determinants of behavioral intention (Performance Expectancy

(PE), Effort Expectancy (EE) and Social Influence (SI)). The second group constitutes of direct determinants of behavioral intention (Intention to use and Facilitating Conditions (FC)). The third group comprises of moderators (gender, age, experience and voluntariness of use). The four moderators seek to understand the following:

- Does age and gender influence the relationship between Performance Expectancy (PE) and Behavioral Intention (BI)?
- Is there a relationship between the independent variables (gender, age, experience and voluntariness) and the dependent variables (Social Influence (SI) and Behavioral Intention (BI))?
- Is there a relationship between the independent variables (gender, age, experience) and the dependent variables (Effort Expectancy (EE) and Behavioral Intention (BI))?
- Is there a relationship between the independent variables (age and experience) and the dependent variables (Facilitating Conditions (FC) and Behavioral Intention (BI))?

To fully explain the relationship that exists between the constructs, Figure 1 below illustrates the relationship that exists between the different dimensions.

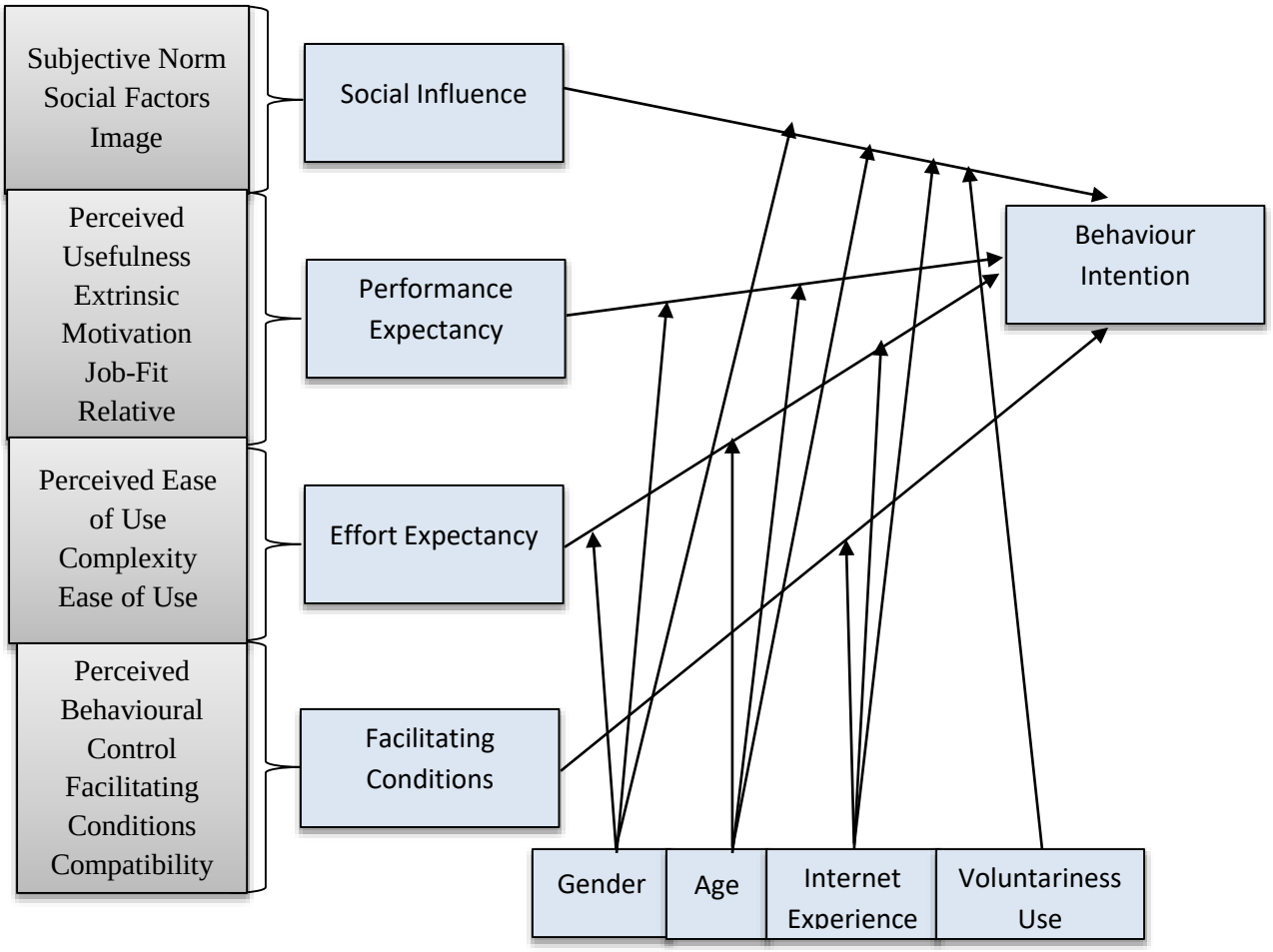

Figure 1: Constructs of the UTAUT Theory (Alkhatib, 2013)

To gain a better understanding of the UTAUT model, Alkhatib (2013) explained the dimensions of the constructs as follows:

***Performance Expectancy (PE)*:** The extent to which a person believes that by using a certain system he/she will have gains in job performance.

***Effort Expectancy (EE)*:** The extent of ease which one gains by using a system.

Social Influence (SI): The extent to which one is inspired to use a system by those around him/her.

***Facilitating Conditions (FC)*:** The extent to which one believes that an institution or organization must be there to support the use of the system.

Behavioral Intention (BI): The influence that stimulates ones intention to do something as a result of one's attitude towards performing that behavior together with beliefs about what others expect him/her to do.

2.3 Factors Affecting M-governance Adoption

2.3.1 Trust in mobile technology

Trust has been recorded by various researchers as difficult to measure. Nkwe (2012) stated that for effective adoption of m-governance in the educational sector, all stakeholders involved should have a strong trust in the internet and in mobile technology. For government projects requiring citizen participation to be a success, the citizens should fully trust the government that it is able to deliver what it has promised (Karavasilis et al., 2010).

2.3.2 Trust in government

For effective adoption of m-governance projects it is crucial for the government to be less corrupt so that its citizens will be able to trust and confide in its services and be willing to support the projects (Karavasilis et al, 2010). The early stages in project implementation determine acceptance and if citizens are willing and ready to trust the government hence governments should focus more on gaining trust from the public.

2.3.3 Trust in the internet

Trusting the internet starts from having confidence and trust in the service provider that the company will work according to the agreement stated on the agreement contract and that it will not breach the contract (Nkwe, 2012). Once citizens are happy with the services rendered they feel that their information is secure and they can trust and depend on the internet they receive from the service provider.

2.3.4 Perceived public value

In thee literature Karavasilis et al. (2010) conducted a study in Berlin to check any significant difference between citizen satisfaction and the usage of m-governance services. Results showed that gender did not have any significant difference on usage of m-governance services. However,

it was noted that perceived usefulness among citizens as well as perceived ease of use greatly enhanced satisfaction among citizens.

2.4 Challenges of M-governance Adoption

Implementing m-governance effectively can be a barrier in most educational institutions if not properly managed (Garg et al., 2011). The following researchers (Garg et al., 2011; Nkwe, 2012; Suklabaidya & Sen, 2013; Seddiky & Ara, 2015) have described the various challenges that hinder effective m-governance adoption as follows:

- *Poor infrastructure*: Due to the high costs of ICT services and infrastructure, many educational institutions do not have the ideal equipment and infrastructure that can effectively support m-governance adoption such as fast and reliable internet connection as well as computers and servers. This has slowed down the adoption of m-governance services in many educational institutions (Garg et al., 2011).

- *Lacking knowledge on the benefits of m-governance adoption:* Most m-governance reported in the literature failed due to lack of public awareness and by so doing citizens failed to realize the benefits they could enjoy by adapting to such a highly demanded technology hence it is crucial for governments to embark on awareness projects and workshops.

- *Inadequate finances:* Educational institutions are unable to fully enjoy the benefits of m-governance adoption due to lack of finances to sustain implementation and most governments are unable to provide academic institutions with a substantial amount that will help in successful implementation.

- *Lack of security and privacy of information:* Putting in place all security checks on m-governance services is often a challenge to most academic institutions due to shortage of funds. Institutions tend to secure the systems as far as their finances allow and such can be a treat to stakeholders since information is passed over the internet where hackers can see confidential data and lead to data leakages which can be a more serious problem (Sultana, 2016)

- *Digital Divide:* This refers to the distinct gap that exists between the privileged and less privileged citizens where students and other educational stakeholders residing in urban areas have access to all m-governance services and fast internet whereas the underprivileged have no access to better ICT services and therefore lag behind in m-governance services.

CHAPTER 3

CONCEPTUAL FRAMEWORK

In this section of the study, the researcher gives a detailed explanation of the different components of m-governance, models for successful adoption of m-governance in the educational sector, key steps that result in effective implementation and the advantages of adapting m-governance in higher educational institutions.

3.1 E-governance Components

In the literature, many researchers (Sultana et al, 2016; Suklabaidya & Sen, 2013) explained the major components or categories of m-governance as government to business, government to government and government to citizens. In addition the researchers explained that for successful implementation it is crucial for governments to be able to effectively communicate with their stakeholders. A detailed description of each component is described below:

- *Government to Government Communication (G2G):* Communication that exist between different govern bodies such as ministry of finance engaging ministry of education on its annual budget or communication between different governments such as government of Turkey communicating with the government of Cyprus on partnering on m-governance service project awareness programs.

- *Government to Business Communication (G2B):* Communication that occurs between the government and different business organizations such as the government requesting the company to pay its tax or the business requesting the government to issue it with a tax clearance certificate (Sultana, 2016). M-governance adoption facilitates online tax payments making the process easier and more efficient.

- *Government to Citizens Communication (G2C):* This refers to the flow of information from the government to its citizens alerting the public of how they must conduct themselves as well as

informing them current projects that the government is embarking on. Proper implementation of m-governance services enables e-voting.

Suklabaidya and Sen (2013) described the interaction that exists between the three main components of m-governance, how the government interacts with businesses and citizens as shown on Figure 2 below.

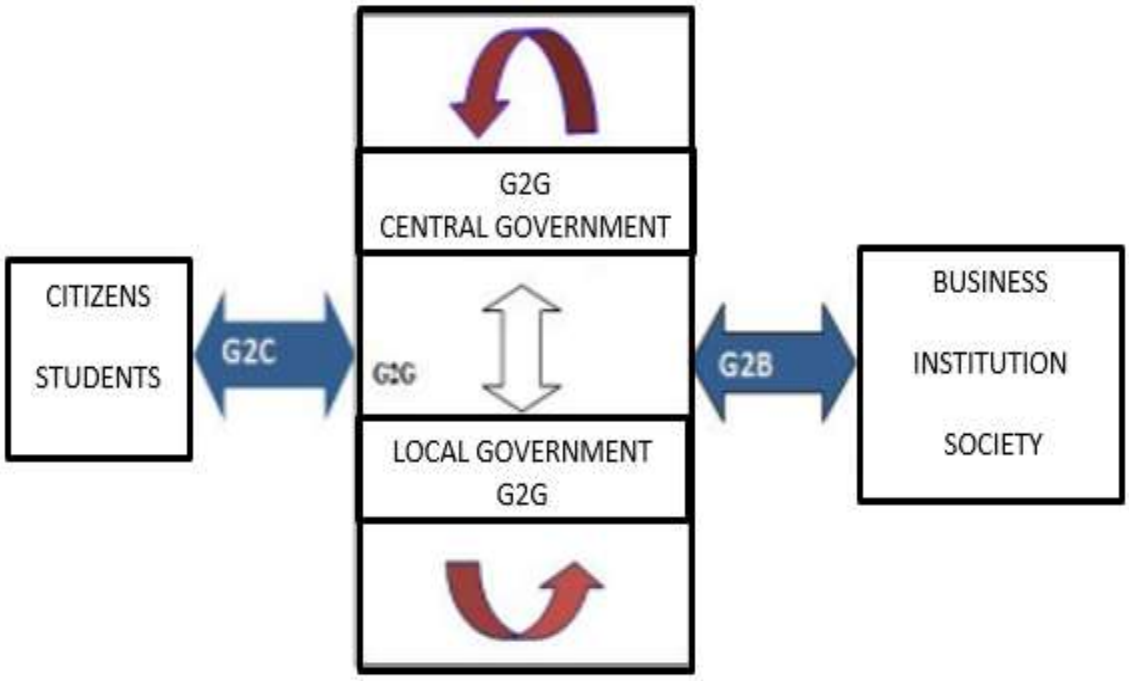

Figure 2: M-governance model (Suklabaidya & Sen, 2013)

3.2 M-governance in Education

The educational sector needs to be restructured to integrate m-governance services. Many educational institutions across the globe are considering shifting towards m-governance service usage. In the literature, Alhomod (2013) described the numerous benefits that educational institutions enjoy as depicted on the model in Figure 3 below.

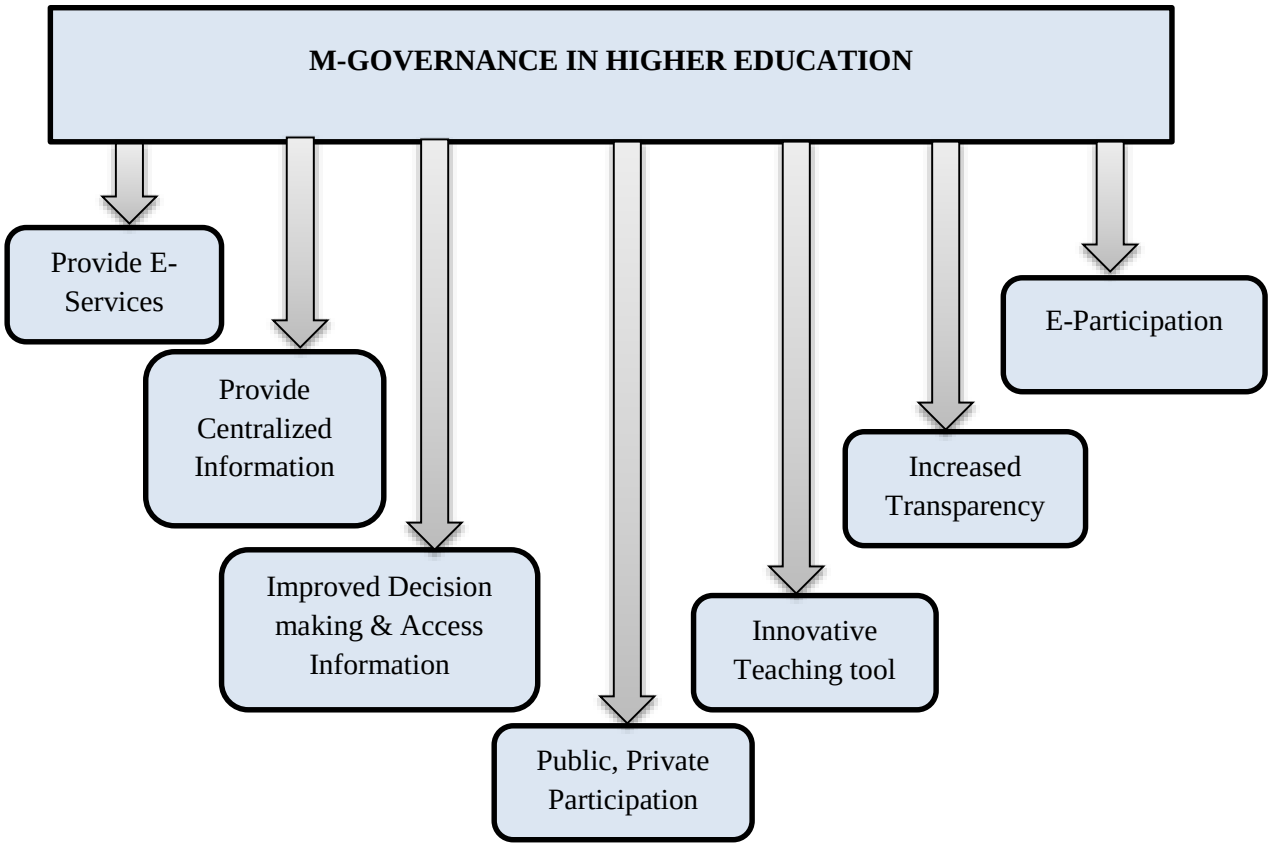

Figure 3: M-governance in Higher Education (Alhomod, 2013)

Provide E Services: M-governance services allow instant real time engagements where different educational stakeholders can interact with each other and share ideas virtually. In addition students can access information regarding exams and registration directly from their mobile devices.

E-Participation: To enhance the overall performance of different departments at educational institutions different stakeholders can engage in the decision making process to enhance the overall performance of the educational sector. Lecturers can obtain essential feedback from students about the courses taken and alumni students can engage currently enrolled students and map way forward on how to improve educational delivery at different educational institutions.

Increasing Transparency – The government seeks to be at par with all its citizens in conducting business in all honesty. To enhance rural development the government shares essential information with the public to gain donations and alert the public with the hope and faith of getting donors.

Innovative Teaching Tools: By adapting m-governance services educational institutions and its various stakeholders can collaborate virtually. Students can interact with their course advisors online through virtual lectures, video conferencing, webinars, and e-libraries.

Private Public Participation – Agencies from both the private and public sector must be invited by the government in planning m-governance service adoption. Empowering various stakeholders such as businesses by providing the required ICT services hence promoting economic growth and promoting indigenization.

Improved decision making and access to information: Information can easily be accessed by students' online allowing students to collaborate and engage different educational stakeholders at a central level and improve the overall decision making.

Centralized Information: Proper handling of data is done at a central level whereby the central database is accessed centrally and data mining tools are used for extracting data as well as differs security measures put in place that promote data security and integrity.

3.3 Work Plan for Establishing an Effective M-governance System

Garg et al. (2011) described essential steps that are crucial and should be followed by any institutions looking forward to a successful m-governance implementation scheme. The steps described by the researchers are explained below in detail:

Management Commitment: Lack of involvement from the upper management can limit effective implementation of m-governance projects. For the projects to be a success it requires top management commitment. Managers from different departments in the educational sector should collaborate with representatives from each stakeholder group for successful implementation of current and future m-governance projects.

Creating the awareness & environment for change: For m-governance projects to be a success it is important for educational institutions and the government as a whole to inform its citizens on the benefits of using such a highly demanded technology in this digital era where mobile penetration is accelerating day by day in various countries (Nkwe, 2012). Institutions should elect

members from different stakeholder groups and conduct meeting, workshops and seminars for public awareness.

Planning Phase: The elected committee should make sure that all key stakeholders are fully aware of the benefits of m-governance adoption and are willing to participate and collaborate with others during the planning phase. Brain storming sessions should be conducted and minutes taken in every session for accountability and as a progress tracker.

Development Phase: Development team should collaborate with software engineers so that they are aware of the design of the current learning management systems so that it can easily be integrated with mobile services offered by the government so that all stakeholders can be reached easily. It is also crucial for various stakeholders to be trained on proper usage and handling of infrastructure during development phase.

*Implementation Phase***:** Once the development phase is over it is important to make sure that all hardware and software is properly integrated. Software testers play a crucial role in making sure that the system is properly working and all departments and various educational faculties are properly integrated so that tracking and transparency is ensured.

*Maintenance & Continuous Improvement***:** The final stage that marks successful implementation is maintenance. Most m-governances systems fail after a successful implementation due to lack of maintenance. For institutions to be able to continue enjoying the benefits of m-governance adoption it is crucial for them to maintain the systems and update data frequently.

3.4 Delone and McLean IS success model - IS Theory

In the literature, many researchers (DeLone & McLean 2003; Sultana et al, 2016, Shaikh & Kasat, 2009; Suklabaidya & Sen, 2013; Batta et al., 2011) pointed out that the assessment of Information Systems (IS) is the most crucial area in the field of Information Systems and Information Technology (IT). In a bid to fully understand Information Systems and their impact, DeLone and McLean developed a model with six constructs constituting three independent variables (System Quality, Information Quality and Service Quality) and three main dependent variables (Net

Benefits, Intention to Use and User Satisfaction) (DeLone & McLean, 2002). Explanations of the dimension names are as follows:

- System Quality: This refer to the characteristics that one anticipates to find in the system.
- Information Quality: This measures the value of the output that the system produces.
- Service Quality: This measures the quality of support that one receives.
- System Use: The method by which a system is used by both staff and customers.
- Net Satisfaction: This measures the degree of fulfilment that one gets by using a system.
- Net Benefits: These refer to the contribution level of Information System towards the success of individuals and groups.

The first model was developed in 1992 and an updated model consisting of six interlinked dimensions was published in 2003 as shown on Figure 4. Proposed associations between success dimensions are illustrated by the arrows. DeLone and McLean (2003) stated that a system can be evaluated in terms of service quality, information and the system itself. Net benefits will influence a user's satisfaction to continue using a system, either positively or negatively.

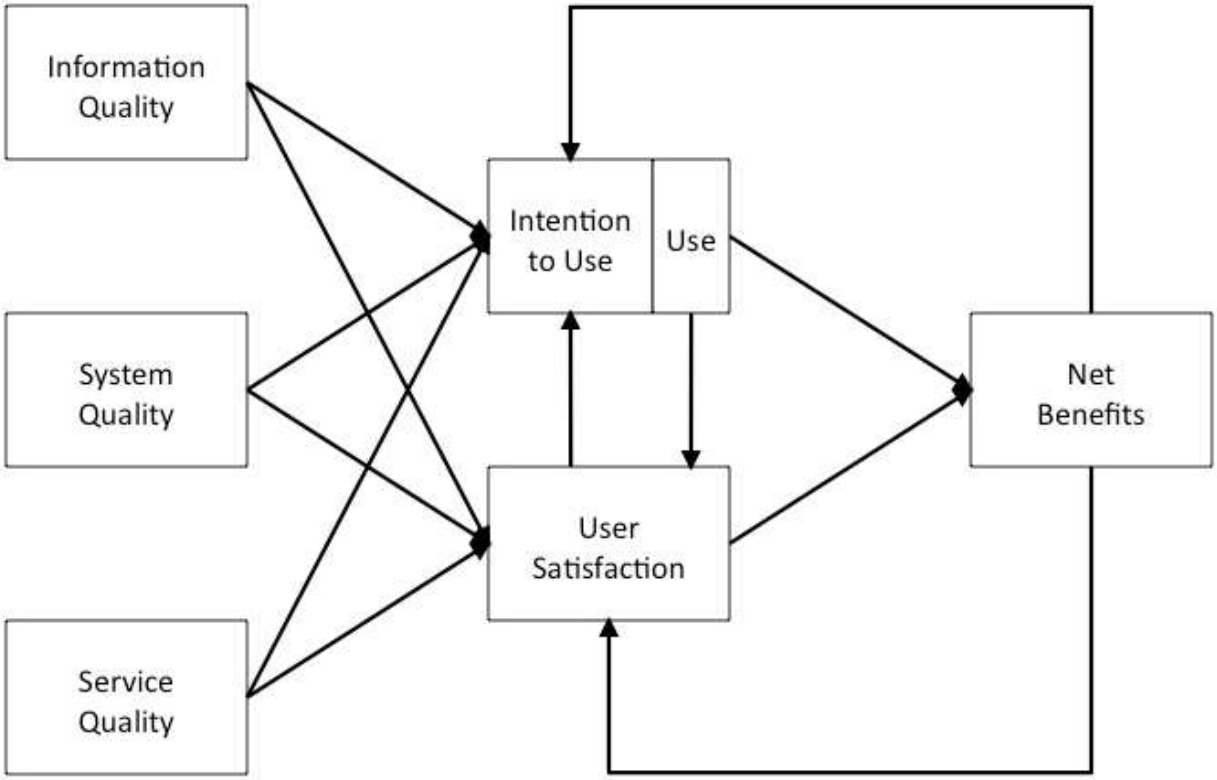

Figure 4: Updated information systems success model (DeLone & McLean, 2003)

CHAPTER 4

RESEARCH METHODOLOGY

In this section of the study, the researcher describes the model that was used in the study, demographic data of the participants, the data collection tool used for data collection, analysis method used to analyze and interpret the results, Gantt chart of the study together with the steps taken in conducting the study and the reliability test for each dimension on the survey.

The purpose of the research is to investigate m-governance services adoption in North Cyprus universities. Figure 5 below shows the research model. The research model consists of dimensions from The Unified Theory of Acceptance and Use of Technology (UTAUT) Model (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions) together with other three dimensions (Trustworthiness, perceived public value and perceived good government and less corruption). The model below illustrates the relationship between the independent and dependent variables and seek to answer the research questions stated in section 1.2 of chapter 1.

4.1 Research Model

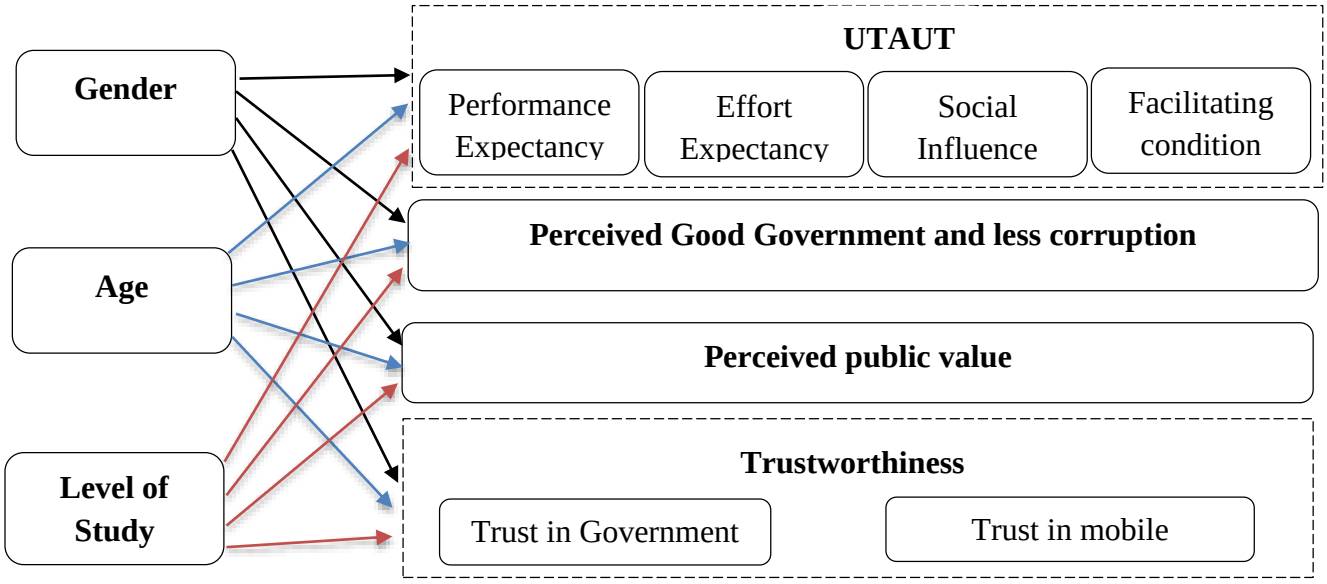

Figure 5: Research Model of the Study

4.2 Research Participants

Participants consisted of students currently enrolled at four universities in North Cyprus which are as follows:

- Near East University,
- Eastern Mediterranean University,
- Cyprus International University,
- Girne American University

Participation of the survey was restricted to students in the departments listed below who have Information Technology background knowledge for the research data to be more reliable:

- Computer Engineering
- Information Technology
- Computer Information Systems
- Management Information Systems
- Computer Technologies and programming

4.2.1 Demographic data of Participants

Table 4.1 below describes the demographic data of participants who participated in the survey. 25.5% (87 students) were from Near East University, 19.1% (65 students) were from Cyprus International University, 28.2% (96 students) were from Eastern Mediterranean University and 27.3% (93 students) were from Girne American University. Males were 193 and females 148 which makes a total population of 341 students. The population comprised of 161 undergraduate students, 146 masters students and 34 PhD students. Age was divided into 3 groups as follows: 18-22, 23-27 and 28 and above with each group having 135, 119 and 87 students respectively.

Table 4.1: Demographic data of participants

University Name	Department	Age group			Total
		18-22	23-27	28 +	
Near East University	Computer Engineering	12	32	12	56
	Information Systems Engineering	_	_	8	8
	Computer Information Systems	14	11	_	23
	Total	**26**	**43**	**20**	**87**
Girne American University	Computer Engineering	_	6	12	18
	Information Technology	13	_	_	13
	Management Information Systems	21	12	_	33
	Computer Technologies and programming	_	22	7	29
	Total	**34**	**40**	**19**	**93**
Cyprus International University	Computer Engineering	16	7	8	31
	Information Technology	17	2	_	19
	Computer Technologies and programming	_	12	3	15
	Total	**33**	**21**	**11**	**65**
Eastern Mediterranean University	Computer Engineering	30	2	_	32
	Information Technology	3	13	10	26
	Management Information Systems	_	5	16	21
	Computer Information Systems	_	6	11	17
	Total	**33**	**26**	**37**	**96**

Table 4.1: Demographic data of participants continued

		Level of study			
		Undergraduate	**Masters**	**PhD**	**Total**
Near East University	Computer Engineering	22	34	_	56
	Information Systems Engineering	0	2	6	8
	Computer Information Systems	23	_	_	23
	Total	**45**	**36**	**6**	**87**
Girne American University	Computer Engineering	_	8	10	18
	Information Technology	13	_	_	13
	Management Information Systems	27	6	_	33
	Computer Technologies and programming	_	29	_	29
	Total	**40**	**43**	**10**	**93**
Cyprus International University	Computer Engineering	16	15	_	31
	Information Technology	19	+_	_	19
	Computer Technologies and programming	_	13	2	15
	Total	**35**	**28**	**2**	**65**
Eastern Mediterranean University	Computer Engineering	32	_	_	32
	Information Technology	9	17	_	26
	Management Information Systems	_	9	12	21
	Computer Information Systems	_	13	4	17
	Total	**41**	**39**	**16**	**96**

Table 4.1: Demographic data of participants continued

		Gender		Total
		M	**F**	
Near East University	Computer Engineering	27	29	56
	Information Systems Engineering	6	2	8
	Computer Information Systems	13	10	23
	Total	**46**	**41**	**87**
Girne American University	Computer Engineering	15	3	18
	Information Technology	8	5	13
	Management Information Systems	17	16	33
	Computer Technologies and programming	15	14	29
	Total	**55**	**38**	**93**
Cyprus International University	Computer Engineering	18	13	31
	Information Technology	10	9	19
	Computer Technologies and programming	12	3	15
	Total	**40**	**25**	**65**
Eastern Mediterranean University	Computer Engineering	17	15	32
	Information Technology	13	13	26
	Management Information Systems	13	8	21
	Computer Information Systems	9	8	17
	Total	**52**	**44**	**96**

4.3 Data Collection Tool

A survey was conducted using a paper-based questionnaire. The questionnaire was adopted from Sultana et al. (2016) and modified by the researcher. The researcher added 2 dimensions which are UTAUT and perceived public value. The questionnaire comprised of 5 parts as illustrated below in Figure 6

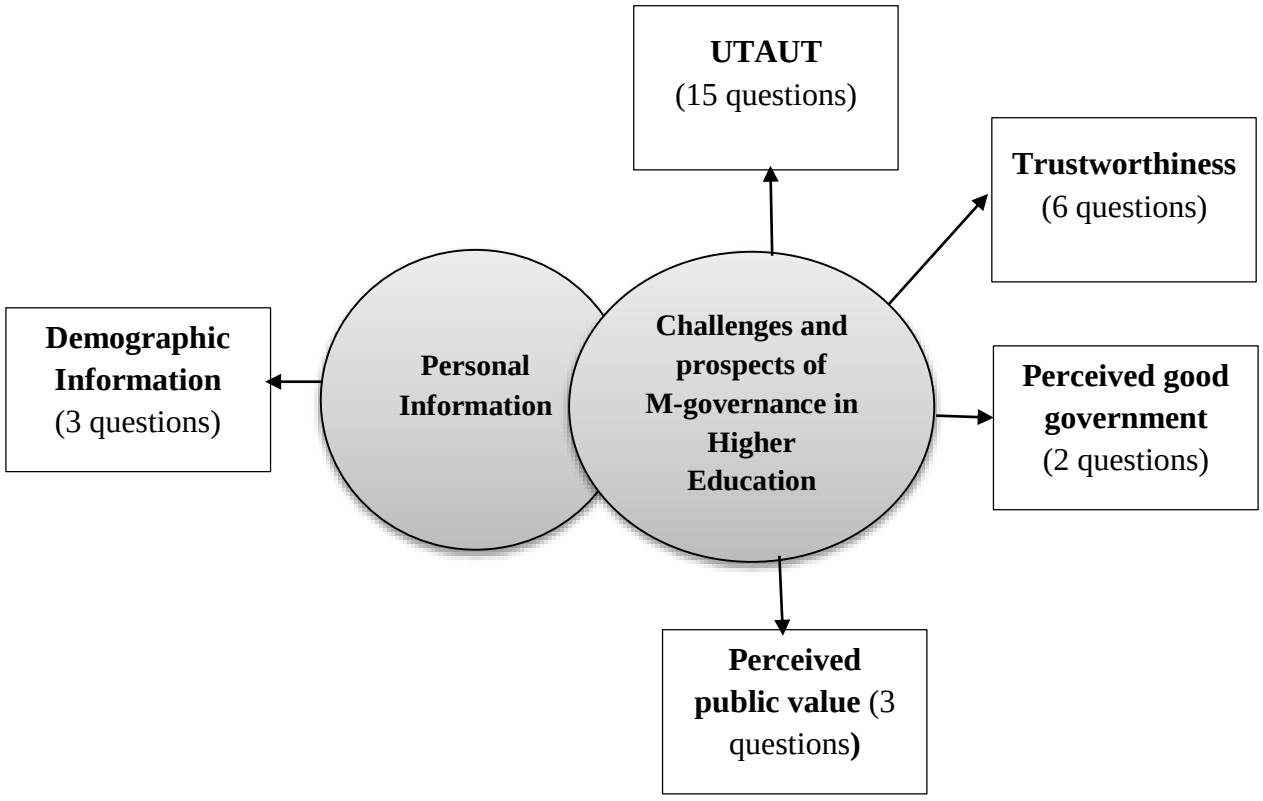

Figure 6: Structure of the questionnaire

4.3.1 Questionnaire Design and Content

The questionnaire (see Appendix 1) had a total of 9 dimensions which were divided into 5 main categories for data analysis. Each dimension is explained in detail below:

- **Demographic information:** The participants stated their gender, level of study and age group range.
- **Trustworthiness**: This section required participants to select the most appropriate responses on trust in mobile technology and trust in Government based on a 5 likert scale.
- **UTAUT:** This section comprised of 4 sub-headings namely: Effort Expectancy, Social Influence, Facilitating Condition and Performance Expectancy. Participants were to select the most appropriate response based on a 5 likert scale.
- **Perceived good government and less corruption**: This section required participants to select the most appropriate responses for the 2 questions based on a 5 likert scale.
- **Perceived public value:** This section required participants to select the most appropriate responses for the 3 questions based on a 5 likert scale.

4.3.2 Reliability Test of survey dimensions

The content of the questionnaire was reviewed by the thesis supervisor to check the feasibility of the study. The Cronbach Alpha of survey dimensions were calculated and the results are shown in Table 4.2 below. The highest Cronbach alpha score was for perceived good government and less corruption which had 0.885, followed by UTAUT which had 0.804, perceived public value had 0.741 and the least was trustworthiness which had 0.708. Cronbach's alpha worth in the scope of .708 to .885 (Table 4.2) which is viewed as great by Cohen (1998). A study conducted by George and Mallery (2003) describes Cronbach alpha results in more detail stating that if the result is less than or equal to 0.5 it is unacceptable, ≥ .5 – it is poor, ≥ .6 –it is questionable, ≥ .7 – it is acceptable, ≥ .8 – is good and .9 – is excellent.

Table 4.2: Reliability test for survey dimensions

Dimension	Cronbach Alpha	No of Items
UTAUT	0.804	15
Trustworthiness	0.708	6
Perceived good government and less corruption	0.885	2
Perceived public value	0.741	3
Overall Items:	**0.889**	**26**

4.4 Data Analysis

Statistical package for social sciences (SPSS) version 20 was used for in-depth data analysis for all the research questions. To answer the following research question, *what are university students' attitude on m-governance services adoption*? The reseacher used descriptive statistics.

The second research question, *Is there any significant difference with respect to gender on: Trustworthiness, Perceived good government and less corruption, Perceived public value and UTAUT?* The researcher used independent t-test with gender as the independent variable and the four dimensions as dependent variables. For the third research question*, is there any significant difference with respect to age on: Trustworthiness, Perceived good government and less corruption, Perceived public value and UTAUT?* ANOVA was used for data analysis with age representing the independent variable and the four dimensions representing dependent variables.

For the last research question, *is there any significant difference with respect to level of study on: Trustworthiness, Perceived good government and less corruption, Perceived public value and UTAUT?* ANOVA was used for data analysis with level of study representing the independent variable and the four dimensions representing dependent variables.

4.5 Research Procedure

To following steps were followed by the researcher during conducting the survey:

1. Literature review was done by the researcher to fully understand the subject, find out what has been discovered by other researchers and also any missing gaps in the literature.
2. The questionnaire was reviewed by the thesis supervisor and corrections were done.
3. Permission letters were sent via email to the four universities to seek permission before the researcher could go and do the field work.
4. During the month of November 2016, 400 questionnaires were distributed to the universities.
5. At the end of November 2016, 341 questionnaires were returned by participants.
6. During the month of December 2016, data was analyzed using SPSS
7. Data collected was analyzed using descriptive statistics, independent t-test and ANOVA.
8. The last chapter of the study discusses results in detail and also propose recommendations for further study.

4.6 Research Schedule and Gantt Chart

The research took a period of 19 weeks to complete as tabulated in Table 4.3 below. Figure7 below also shows the Gantt chart for the research.

Table 4.3: Research schedule

TASK	DURATION
Thesis proposal	3 weeks
Thesis Writing	6 weeks
Visiting University and seeking Approval	1 weeks
Data Collection	4 weeks
Data Analysis	2 weeks
Final thesis draft	1 week
Corrections and preparing for defense	2 weeks
Total	**19 weeks**

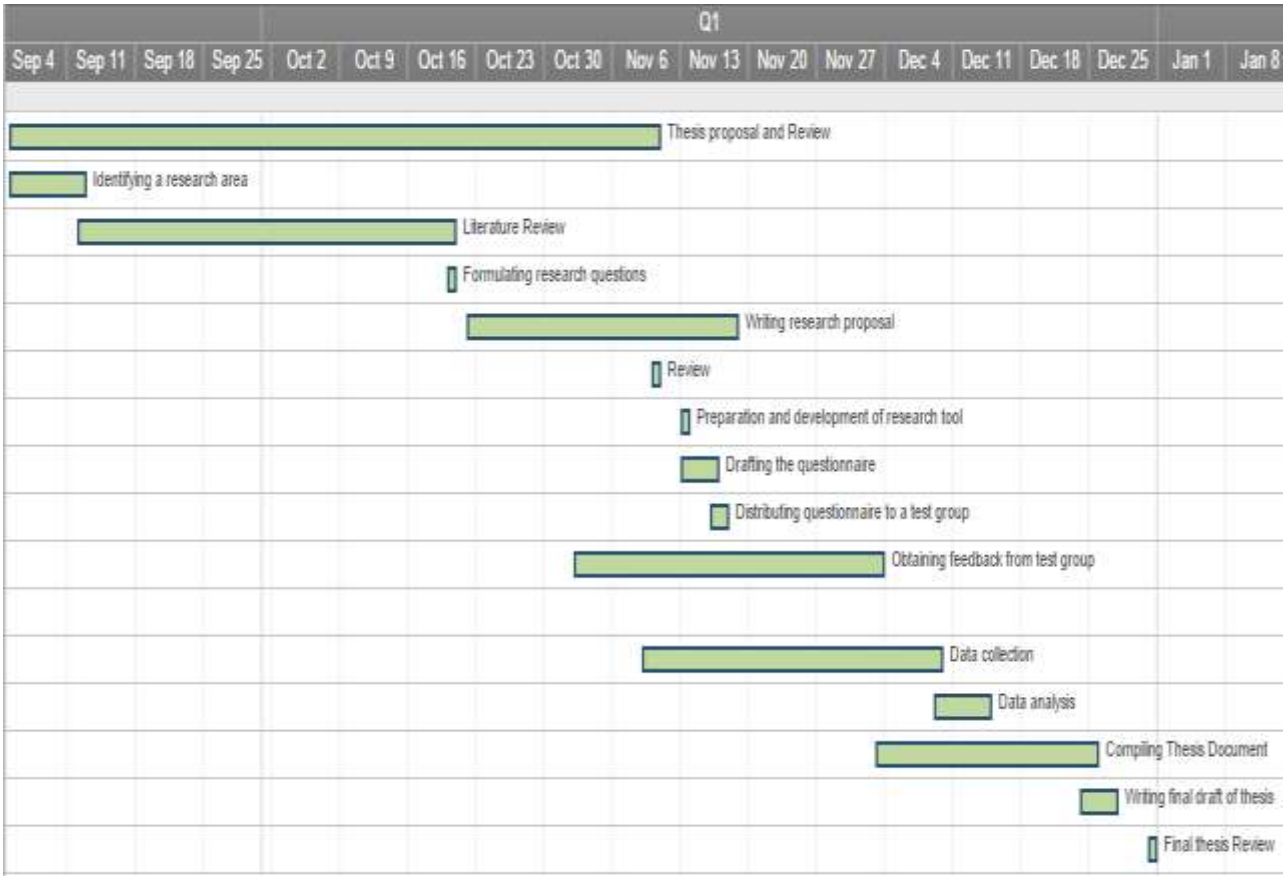

Figure 7: Showing gantt chart for the research

CHAPTER 5

RESULTS AND DISCUSSIONS

In this section of the study, the researcher gives a detailed explanation of the research findings he found and compares the results with those of previous researchers before drawing a conclusion based on the similarity of results or differences.

5.1 Students' attitude on the current usage of m-governance services in North Cyprus

In order to understand students'attitude on the current usage of m-governance services in North Cyprus, the researcher used descriptive statistics. Table 5.1 below shows the standard deviation and mean for each dimension. Results shown are based on selections which participants chose on a 5 Likert scale.

From the results we can clearly see that the highest mean was found in Performance Expectancy (M=4.52; SD=0.76), on second ranking was Perceived Public Value (M=4.50; SD=0.79), on third ranking was Facilitating Conditions with (M=4.38; SD=07.9), on forth ranking was Social Influence (M=3.79; SD=0.69), on fifth ranking was Trust in Mobile Technology with (M=3.75; SD=0.96), on sixth ranking was Perceived good Government and less corruption with (M=3.59; SD=0.92), on seventh ranking was Trust in Government with (M=3.49; SD=0.99) and the least to be ranked was Effort Expectancy with (M=3.48; SD=0.89). Total mean average and standard deviation for all the constructs in the questionnaire was (M=3.89, SD=0.79). The lowest mean was 3.49 for trust in government which means that citizens have a low trust in the government, further research is needed to understand the reason behind this low mean which could be corruption. The highest mean was performance expectancy with a mean of 4.52 which clearly show that when citizens perceive benefits from using technology they are willing to adopt the new technology. This clearly show that students are willing and ready to adopt m-governance services.

A similar study conducted by Sultana (2016) with similar dimensions had the following ranking from the highest mean to the lowest: Performance Expectancy, Effort Expectancy, Social Influence, Trust in Government, Trust in Mobile Technology, Perceived Public Value, Perceived

good Government and less corruption and Facilitating Conditions. Comparing the researcher's results with the findings of this study we can therefore conclude that Performance Expectancy is had the highest mean implying that people are willing to use m-governance services when they perceive they will benefit considerably from it. Alkhatib (2013) supports this assertion when he described Performance Expectancy as the extent to which a person believes that by using a certain system he/she will have gains in job performance.

5.2 The difference between Gender and UTAUT

A statistical analysis was conducted to find out if there is any difference between gender and UTAUT considered as one dependent variable by taking the average score of all sub-dimensions (Effort Expectancy, Social Influence, Facilitating Condition and Performance Expectancy). The researcher conducted an independent t-test using the assumption stated by Levene's test for equality prior to testing each dimension in order to assess if the assumption satisfy each parametric test. Results showed that there is no significant difference between the two variables (t = - 1.24, p=0.21) in the scores for males (M=2.45, SD=0.59) and females (M=2.53, SD=0.64) as shown in Table 5.2 below. These results show that there is no significant difference between gender and UTAUT. It can be concluded that the differences between two means are likely due to chance and not due to gender differences. Weerakkody (2009) and Garg et al. (2011) also found similar results in their study conducted in Malaysia and concluded that there was no significant difference between gender and all variables in UTAUT.

Table 1.2: Statistical differences between gender and UTAUT

Gender	N	Mean	SD	Mean Difference	*t*	p
Male	193	2.45	0.59	-0.84	-1.24	0.21
Female	148	2.53	0.64			

*****The mean difference is significant at .05 level

Table 5.1: Descriptive parameters for m-governance adoption in north cyprus

Item		Mean	SD
Section II: Trust in mobile technology			
1.	I regularly have access to a mobile device such as a mobile phone/ tablet	4.01	0.98
2.	I often access government services using my mobile device	3.69	0.98
3.	I prefer to use a phone/ tablet to access online government services than a desktop computer	3.73	0.94
Total		**3.75**	**0.96**
Section III: Trust in Government			
4.	I am willing to share personal information using my mobile phone with other government service providers (e.g. Universities)?	2.50	1.06
5.	I have conducted government service transactions using my mobile device e.g. pay school fees or exam fee?	3.61	0.97
6.	I trust that the government will keep the information you share with them safe	4.01	1.01
Total		**3.49**	**0.99**
Section IV: Effort expectancy			
7.	I frequently use m-governance services to check updates on educational news and programs	3.68	0.98
8.	Learning m-governance system would be easy	3.77	0.98
9.	You do not need to be skilled to use m-governance services	3.01	0.88
T o t a l		**3.48**	**0.89**

Table 5.1: Descriptive parameters for m-governance adoption in north cyprus continued

Section V: Social influence		
10. People who are important to me think I should use m-governance services	4.65	0.70
11. I would use online government services if I needed to	4.58	0.82
12. I would use online government services if my friends used them	3.75	0.82
13. People who use m-governance services are better in the society	3.00	0.59
T o t a l	**3.79**	**0.69**
Section VI: Facilitating condition		
14. General information (Weather forecast, tourism, recreation)	3.69	1.11
15. Specific information (exchange rates, exam results, road closures)	4.24	0.81
16. Emergency alerts (Severe weather, terrorism, accidents, fire)	4.53	0.86
17. Health and safety education	3.48	0.72
18. SMS notifications about exam results, grades, admission and registration	4.56	0.83
Total	**4.38**	**0.79**
Section VII: Performance expectancy		
19. I think m-governance provide a more convenient way to access government services	4.56	0.69
20. I think m-governance services would be more effective if they were personalized for me as an individual	4.58	0.81
21. M-governance services are available to me 24/7	4.55	0.81
Total	**4.52**	**0.76**

Table 5.1: Descriptive parameters for m-governance adoption in north cyprus continued

Section VIII : Perceived good government and less corruption		
22. I think m-governance services are the preferable option to help make educational processes more clear	3.66	0.99
23. I am well informed about on-going educational government projects	3.55	1.04
T o t a l	**3.59**	**0.92**
Section IX: Perceived public value		
26. Implementation of m-governance has increased the speed with which students are served at the university	4.25	0.75
27. I am familiar with the benefits of m-government	4.65	0.69
28. I predict that I will use m-governance services in the future	4.58	0.85
Total	**4.50**	**0.78**
Total mean for M-governance services adoption	**3.89**	**0.79**

5.3 The difference between Gender and Trustworthiness

A statistical analysis was conducted to find out if there is any difference between gender and all dependent variables for Trustworthiness (Trust in mobile technology and Trust in Government). The researcher conducted an independent t-test using the assumption stated by Levene's test for equality prior to testing each dimension in order to assess if the assumption satisfy each parametric test. Results showed that there is no significant difference between the two variables ($t = 0.45$, $p=0.65$) in the scores for males ($M=2.44$, $SD=0.68$) and females ($M=2.40$, $SD=0.74$) as shown on Table 5.3 below. These results show that there is no significant difference between gender and Trustworthiness. It can be concluded that the differences between the two means are likely due to

chance and not due to gender differences. However, our results contradict to those found by Weerakkody (2009) who conducted a research and found out that gender had a significant influence on trust as far as m-governance adoption is concerned.

Table 5.3: Statistical differences between gender and Trustworthiness

Gender	N	Mean	SD	Mean Difference	*t*	p
Male	193	2.44	0.68	-0.35	0.45	0.65
Female	148	2.40	0.74			

*****The mean difference is significant at .05 level

5.4 The difference between Gender and Perceived Good Government and Less Corruption

A statistical analysis was conducted to find out if there is any difference between gender and perceived good government and less corruption. The researcher conducted an independent t-test using the assumption stated by Levene's test for equality prior to testing each dimension in order to assess if the assumption satisfy each parametric test. Results showed that there is no significant difference between the two variables (t = - 0.32, p=0.74) in the scores for males (M=2.53, SD=0.92) and females (M=2.56, SD=0.85) as shown on Table 5.4. These results show that there is no significant difference between gender and perceived good government and less corruption. It can be concluded that the differences between the two means are likely due to chance and not due to gender differences. Similar findings were found by Garg et al. (2013) and Nkwe (2012) who found out that gender did not have any significant influence on perceived good government as far as m-governance adoption is concerned.

Table 5.4: Statistical differences between gender and Perceived good government and less corruption

Gender	N	Mean	SD	Mean Difference	*t*	p
Male	193	2.53	0.92	-0.32	-0.32	0.74
Female	148	2.56	0.85			

*****The mean difference is significant at .05 level

5.5 The difference between Gender and Perceived Public Value

A statistical analysis was conducted to find out if there is any difference between gender and perceived public value. The researcher conducted an independent t-test using the assumption stated by Levene's test for equality prior to testing each dimension in order to assess if the assumption satisfy each parametric test. Results showed that there is no significant difference between the two variables (t = - 0.67, p=0.50) in the scores for males (M=2.47, SD=0.77) and females (M=2.53, SD=0.76) as shown on Table 5.5. These results show that there is no significant difference between gender and perceived public value. It can be concluded that the differences between the two means are likely due to chance and not due to gender differences. Seddiky and Ara (2015) also found out that there was no significant difference between gender and perceived public value as far as m-governance adoption is concerned.

Table 5.5: Statistical differences between gender and perceived public value

Gender	N	Mean	SD	Mean Difference	*t*	p
Male	193	2.47	0.77	-0.56	-0.67	0.50
Female	148	2.53	0.76			

*****The mean difference is significant at .05 level

5.6 The difference between Age and UTAUT

A one-way ANOVA was employed in order to assess the difference between age and UTAUT as total dimension. Results showed that variances for UTAUT components were not equal based on the assumption of Levene's test of homogeneity. There was no significant difference between age and UTAUT at $p > 0.05$ for all three levels ($F = 1.76$, $p = 0.17$) as shown on Table 5.6. These results suggest that age does not have any effect on UTAUT. Similar findings were found by Weerakkody (2009) who found out that age did not have any significant influence on m-governance adoption.

Table 5.6: Differences between age and UTAUT

Dimension	Age	N	Mean	SD	F	p
	18-22	135	2.52	0.49	1.76	0.17
UTAUT	23-27	119	2.52	0.72		
	28 and above	87	2.38	0.64		
	Total	**341**	**2.49**	**0.61**		

*****The mean difference is significant at .05 level

5.7 The difference between Age and Trustworthiness

A one-way ANOVA was employed to compare the difference between age and Trustworthiness. Results showed that variances for Trust components were not equal based on the assumption of Levene's test of homogeneity There was no significant difference between age and Trustworthiness at $p > 0.05$ for all three levels ($F = 1.40$, $p = 0.25$) as shown on Table 5.7. These results suggest that age does not have any effect on Trustworthiness. Similar findings were found by Weerakkody (2009) and Nkwe (2012) who found out that age did not have any significant influence on trustworthiness.

Table 2: Differences between age and Trustworthiness

Dimension	Age	N	Mean	SD	F	P
	18-22	135	2.45	0.62	1.40	0.25
Trustworthiness	23-27	119	2.47	0.81		
	28 and above	87	2.32	0.66		
	Total	**341**	**2.42**	**0.70**		

*****The mean difference is significant at .05 level

5.8 The difference between Age and Perceived Good Government and Less Corruption

A one-way ANOVA was employed to compare the difference between age and perceived good government and less corruption. Results showed that variances for perceived good government and less corruption components were equal at ($p<0.05$) based on the assumption of Levene's test

of homogeneity. However, there was no significant difference between age and perceived good government and less corruption at $p > 0.05$ for all three levels ($F = 0.23$, $p = 0.80$) as shown on Table 5.8. These results suggest that age does not have any effect on perceived good government and less corruption. However, contradicting results were found in the literature by many researchers (Garg et al., 2011; Weerakkody, 2009) who pointed out that good government is directly connected to m-governance adoption, If citizens feel that the government is less corrupt and is concerned with their wellbeing they are most willing to adapt to services offered by the government.

Table 5.8: Differences between age and perceived good government and less corruption

Dimension	Age	N	Mean	SD	F	P
Perceived good government and less corruption	18-22	135	2.45	0.79	0.23	0.80
	23-27	119	2.47	1.00		
	28 and above	87	2.32	0.87		
	Total	**341**	**2.42**	**0.89**		

*****The mean difference is significant at .05 level

5.9 The difference between Age and Perceived Public Value

A one-way ANOVA was employed to compare the difference between age and perceived value. Results showed that variances for perceived value components were equal at ($p<0.05$) based on the assumption of Levene's test of homogeneity. There was significant difference between age and perceived value at $p < 0.05$ for all three levels ($F = 3.66$, $p = 0.03$) as shown on Table 5.9. Post hoc comparisons using Tukey HSD test indicated that the mean score for 18-22 was ($M = 2.59$, $SD = 0.70$), 23-27 age group ($M = 2.52$ $SD = 0.86$) and for the 28 years and above age group ($M = 2.31$, $SD = 0.71$). Students at the age group 18-22 have higher mean scores than students in age group 28 and above in perceived public value. Younger students feel more positive about perceived public value of m-governance adoption as compared to older students. Similar results were found by Garg et al. (2011) that age does have an influence on the adoption of m-governance services. The older people get, the more knowledgeable they become on the uses of m-governance services and also more knowledge on internet services.

Table 5.9: Differences between age and perceived public value

Dimension	Age	N	Mean	SD	F	P
Perceived public value	18-22	135	2.59	0.70	3.66	**0.03***
	23-27	119	2.52	0.86		
	28 and above	87	2.31	0.71		
	Total	**341**	**2.50**	**0.77**		

5.10 The difference between Level of Study and UTAUT

A one-way ANOVA was conducted to compare the difference between Level of study and UTAUT. Results showed that variances for UTAUT components were not equal based on the assumption of Levene's test of homogeneity. There was no significant difference between Level of study and UTAUT at $p > 0.05$ for all three levels ($F = 0.27$, $p = 0.77$) as shown on Table 5.10. These results suggest that level of study does not have an effect on UTAUT. Suklabaidya and Sen (2013) also found out that level of study did not have any influence on m-governance adoption in their research in Iraq.

Table 5.10: Differences between level of study and UTAUT

Dimension	Level of Study	N	Mean	SD	F	P
UTAUT	Undergraduate	161	2.49	0.56	0.27	0.77
	Masters	146	2.47	0.61		
	PhD	34	2.55	0.81		
	Total	**341**	**2.49**	**0.62**		

***The mean difference is significant at .05 level

5.11 The difference between Level of Study and Trustworthiness

A one-way between subjects ANOVA was conducted to compare the difference between Level of study and Trustworthiness. Results showed that variances for Trust components were not equal based on the assumption of Levene's test of homogeneity.. There was no significant difference

between Level of study and Trustworthiness at $p > 0.05$ for all three levels ($F = 0.33$, $p = 0.72$) as shown on Table 5.11. These results suggest that level of study does not have an effect on Trustworthiness. In the literature, many researchers (Suklabaidya & Sen, 2013; Nkwe, 2012) also found out that level of study did not have any influence on trust of m-governance services.

Table 5.11: Differences between level of study and Trustworthiness

Dimension	Level of Study	N	Mean	SD	F	P
Trustworthiness	Undergraduate	161	2.45	0.70	0.33	0.72
	Masters	146	2.40	0.72		
	PhD	34	2.36	0.68		
	Total	**341**	**2.42**	**0.70**		

*****The mean difference is significant at .05 level

5.12 The difference between Level of Study and Perceived Good Government and Less Corruption

A one-way ANOVA was conducted to compare the difference between Level of study and perceived good government and less corruption. Results showed that variances for perceived good government and less corruption components were not equal based on the assumption of Levene's test of homogeneity. There was no significant difference between Level of study and perceived good government and less corruption at $p > 0.05$ for all three levels ($F = 1.67$, $p = 0.19$) as shown on Table 5.12. These results suggest that level of study does not have an effect on perceived good government and less corruption. Suklabaidya and Sen (2013) also found out that level of study did not have any influence on m-governance adoption as far as good governance is concerned. When citizens perceive the government to be less corrupt they are keen to use its services despite their level of study.

Table 5.12: Differences between level of study and perceived good government and less corruption

Dimension	Level of Study	N	Mean	SD	F	P
Perceived good government and less corruption	Undergraduate	161	2.49	0.84	1.67	0.19
	Masters	146	2.54	0.95		
	PhD	34	2.80	0.88		
	Total	**341**	**2.54**	**0.89**		

*****The mean difference is significant at .05 level

5.13 The difference between Level of Study and Perceived Public Value

A one-way ANOVA was conducted to compare the difference between Level of study and perceived public value. Results showed that variances for perceived public value components were not equal based on the assumption of Levene's test of homogeneity. There was no significant difference between Level of study and perceived public value at $p > 0.05$ for all three levels ($F = 0.15$, $p = 0.86$) as shown on Table 5.13. These results suggest that level of study does not have an effect on perceived public value. Nkwe (2012) also found out that level of study does not influence perceived value in m-governance adoption. When citizens perceive they will benefit from services rendered they are willing to use services no matter their level of study.

Table 5.13: Differences between level of study and perceived public value

Dimension	Level of Study	N	Mean	SD	F	P
Perceived public value	Undergraduate	161	2.52	0.75	0.15	0.86
	Masters	146	2.47	0.78		
	PhD	34	2.48	0.80		
	Total	**341**	**2.50**	**0.77**		

*****The mean difference is significant at .05 level

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

To sum-up all research findings explained in the previous chapters, the researcher now gives his final say on the topic and states recommendations which he proposes for future studies to be undertaken.

6.1 Conclusion

The outcomes of this study are as follows:

- Findings revealed that students in North Cyprus are aware of other m-governance services offered to citizens by their government, however not all students are fully using all the services provided. SMS notifications showing exam results, grades, admission and registration process were ranked as the most important m-governance service provided by the government and educational institutions. In addition, emergency alert notifications and specific information regarding exchange rates and road closures were rated as the second important m-governance service provided by the state. However, general information such as weather updates, recreation and health and safety information were rated at neutral. This shows the need for awareness on these services provided by the government.
- Research findings also showed that there was no significant difference between gender and all dependent variables (UTAUT, Trustworthiness, Perceived good government and less corruption and Perceived public value). Gender has no effect on the sub-dimensions of the aforementioned attributes. This is most likely because gender is has no effect on technology adoption, anyone can adopt to technology so long he/she perceives benefits (Nkwe, 2012).
- There was no significant difference between level of study and all dependent variables. Furthermore, there was no significant difference between age and three dependent variables (UTAUT, Trustworthiness and Perceived good governance and less corruption).
- There was a significant difference between age and perceived public value mainly between the two age groups (18-22 and 28 and above) this suggest that as people mature in age they

tend to perceive more benefits and become more knowledgeable of m-governance services at their disposal.

- During conducting the research, the researcher also observed that there is a high level of mobile penetration into the country and this suggests that there will be demand for m-governance services in the future due to the mobility they offer anytime and anywhere so long there is internet connection.
- The availability of hot spots and free internet at large malls and public areas such as restaurants also promise high demand for m-governance services in the future.
- Results also showed that lack of trust in m-governance services was another barrier to its adoption among university students. Students do not fully trust the services conducted over the internet especially to perform financial transactions. This is a potential threat to future m-governance adoption success.

6.2 Recommendations

- The research was conducted over a short period of time over the fall semester of 2016. The researcher strongly recommends further research which can be done over a longitudinal period of time and also focusing on all universities in North Cyprus to fully understand the level of m-governance adoption and other challenges which may not have been revealed by this study due to the limitations of time and geographical coverage.
- The researcher strongly recommends awareness programs to be conducted in every city to aware citizens of the benefits of using m-governance services already at their disposal but however some are unaware.
- Qualitative studies with in depth interview could also be conducted for further inquiry about m-governance adoption at Higher Education Institutions.

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APPENDIX 1

M-GOVERNANCE SERVICES ADOPTION IN NORTH CYPRUS UNIVERSITIES QUESTIONNAIRE

M-governance services adoption in North Cyprus universities questionnaire

This questionnaire is for the data collection part of MSc thesis study in order to identify university students' opinions on challenges and prospects of m-governance services adoption that are already used or planned to be used in educational institutions.

The participation to this questionnaire is voluntary. If you decide to participate any information revealed here will definitely be kept confidential and only used for academic publication purposes. Please read the instructions carefully and choose the response which is most convenient for you. Please select only one answer or each question and answer all questions.
Thank you in advance for your participation.

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Definition of m-governance services in HEI: It involves government to customer (G2C) services which distributes information to citizens. The government services are mainly comprised of pushing information through SMS, for example, or making it available on a Web or WAP site.
General M-governance services can be classified as follows;

1. **General information for citizens** (e.g. weather, tourism, recreation health, public safety, contact information, services, regulations)**;**
2. **Specific information** (e.g. exchange rates, market rates, exam results, events and programs, news, road closures, holiday schedules, public hearing/meeting schedules, service or fee changes);
3. **Emergency alerts** (e.g. severe weather, terrorism, fires, accidents, Health risks);
4. **Health and safety education** (prevention and preparedness);
5. **Notifications** (e.g. library book deadlines, Security notifications, Social media posts, RSS feeds for news and updates);
6. **Education services** (e.g. grades, admissions, exam results);

In higher education m-governance services can be divided into 3 main types:
M-Administration: The usage of ICT (Information and Communication Technology) in order to improve administration processes.
M-Services: To improve the delivery of services to students by providing interactive services such as: requests for documents, requests for certificates, issuing admit cards and ID cards
M-Participation: The use of Information Technology (IT) in every aspect of life has resulted in faster, easier and much better delivery of services by redefining the fundamental principles of delivery of services.

Section I: Demographic information of participant

1. **Gender:**

○ Male ○ Female

2. **In what age group are you?**

○ 18-22 ○ 23-27 ○ 28 and above

3. **Level of Study**

○ Undergraduate ○ Master Student ○ PhD student

Section II: Trust in mobile technology	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
4. I regularly have access to a mobile device such as a mobile phone/ tablet					
5. I often access government services using my mobile device					
6. I prefer to use a phone/ tablet to access online government services than a desktop computer					
Section III: Trust in Government	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
7. I am willing to share personal information using my mobile phone with other government service providers (e.g. Universities)?					
8. I have conducted government service transactions using my mobile device e.g. pay school fees or exam fee?					
9. I trust that the government will keep the information you share with them safe					

Section IV: Effort expectancy	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10. I frequently use m-governance services to check updates on educational news and programs					
11. Learning m-governance system would be easy					
12. You do not need to be skilled to use m-governance services					
Section V: Social influence	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
13. People who are important to me think I should use m-governance services					
14. I would use online government services if I needed to					
15. I would use online government services if my friends used them					
16. People who use m-governance services are better in the society					
Section VI: Facilitating condition Based on a personal preference, rate m-governance SMS services provided by the Government to citizens	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
17. **General information** (Weather forecast, tourism, recreation)					
18. **Specific information** (exchange rates, exam results, road closures)					
19. **Emergency alerts** (Severe weather, terrorism, accidents, fire)					
20. **Health and safety education**					
21. **SMS notifications** about exam results, grades, admission and registration					

Section VII: Performance expectancy	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
22. I think m-governance provide a more convenient way to access government services					
23. I think m-governance services would be more effective if they were personalized for me as an individual					
24. M-governance services are available to me 24/7					
Section VIII : Perceived good government and less corruption	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
25. I think m-governance services are the preferable option to help make educational processes more clear					
26. I am well informed about on-going educational government projects					
Section IX: Perceived public value	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
29. Implementation of m-governance has increased the speed with which students are served at the university					
30. I am familiar with the benefits of m-government					
31. I predict that I will use m-governance services in the future					

Thank you for participating in the survey