The Applicability of Technology Acceptance Model 3 in an Education Management Information System in the Kingdom of Saudi Arabia

By

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Abstract

This study aims to explore the applicability of Technology Acceptance Model 3 in the Kingdom of Saudi Arabia in an educational context. Therefore, this study investigates the antecedents, moderators, and socio-demographic variables relating to Technology Acceptance Model 3, and what their effect is on technological acceptance.

The Kingdom of Saudi Arabia has witnessed rapid growth with the adoption of information systems that have enhanced its services. The Noor system is considered to be one of the largest adopted information systems in the Middle East (Abu-Ghazaleh, 2012). It is an education management information system that manages information and educational data; it also serves 65 stakeholders and more than ten million users. Information systems have previously been investigated in terms of their success, satisfaction, acceptance, and system usage. Some literature suggests that understanding individual acceptance and use of information technology is among the most mature streams of information systems research (Benbasat and Barki, 2007; Hirschheim, 2007; Mardiana et al., 2015; Rondan-Cataluña et al., 2015). Thus, studying the Noor system using Technology Acceptance Model 3 should promote usage and explore factors that hinder its usage. It is nevertheless clear that the implementation process presented its own challenges.

The study was based in the Kingdom of Saudi Arabia. A total of 730,180 emails were sent, and 10,711 responses were received. Therefore, the overall response rate was 1.47 percent. The sample comprised both male and female users from three groups: 1,655 teachers (15.5%); 3,666 students (34.2%); and 5,390 parents (50.3%). A comprehensive online questionnaire was designed to suit the study using Technology Acceptance Model 3 literature. This were pre-tested, validated, and then uploaded to the Smart Survey online database for data collection. Technology Acceptance Model 3 was adopted to identify factors that determine the use of the Noor system. Previous literature reviews concerning Technology Acceptance Model 3 were used to formulate the hypotheses that governed the relationships between constructs.

A hypothetico-deductive method was used to investigate the aim and objectives of this study both under the mandatory and voluntary conditions. The questionnaires had 16 main hypotheses, alongside three extra hypotheses (investigating the effect of socio-demographic variables, and the *beta* estimates and their effect on H2 and H3), thus bringing the total number of hypotheses for the entire study to 19. The survey was designed to capture information from both Saudi and non-Saudi users of the Noor system. The main data analysis was conducted using structural equation modelling in AMOS: specifically, the maximum likelihood estimate method, and moderation testing.

Technology Acceptance Model 3 was found to be appropriate for studying the Noor system in the Kingdom of Saudi Arabia. It was found to be applicable to the Kingdom of Saudi Arabia when studying the Noor system under both the mandatory and voluntary conditions. Likewise, it was found to be applicable to the non-Saudi from other Middle Eastern countries who used Arabic as their main teaching language. The study also found that Technology Acceptance Model 3 should not only be limited to its traditional moderators, but rather that researchers should explore the possibility of testing and incorporating additional socio-demographics as moderators. Likewise, a Saudi cultural background was found to have a strong effect on Behavioural Intention in using the Noor system, as well as Perceived Usefulness when compared to the non-Saudi from other Middle Eastern countries. Lastly, the study noted the importance of measuring Use Behaviour in Technology Acceptance Model 3 and not ignoring this factor, especially with self-reported usage.

The study offers numerous contributions to the literature on Technology Acceptance Model 3, regarding both main relationships and socio-demographic variables. It can thus be concluded that this study should have some impact beyond the borders of the Kingdom of Saudi Arabia, especially in the Middle East. The findings and recommendations of this study lay a strong groundwork for enacting policy measures, alongside implementation by the government of the Kingdom of Saudi Arabia, to ensure that the Noor system is a success within and beyond the borders of Saudi Arabia.

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Glossary of Abbreviations

AMOS	Analysis of moment structures
ADF	Asymptotically distribution-free estimates
AVE	Average variance extracted
BI	Behavioural Intention
B2C	Business-to-customer
CR	Composite Reliability
CANX	Computer Anxiety
CPLAY	Computer Playfulness
CSE	Computer Self-Efficacy
C-TAM-TPB	Combined Technology Acceptance Model and Theory of Planned Behaviour Model
CFA	Confirmatory factor analysis
DOI	Diffusion of innovation theory
EXP	Experience
GIT	Green information technology
IMG	Image
ICT	Information and communication technology
IS	Information systems
IT	Information technology
IBAM	Internet banking acceptance model
REL	Job Relevance
KPIs	Key performance indicators
KSA	Kingdom of Saudi Arabia
MLE	Maximum likelihood estimates
m-Learning	Mobile learning
ME	Middle East
MOE	Ministry of Education
MM	Motivational model
OU	Objective Usability
OTE	Organisational, technical, and environmental model
OUT	Output Quality
PEOU	Perceived Ease of Use
ENJ	Perceived Enjoyment
PU	Perceived Usefulness
PEC	Perceptions of External Control
PCs	Personal computers
RES	Results Demonstrability
SB	Satorra-Bentler
SMEs	Small and medium enterprises
SCT	Social cognitive theory

SPSS	Statistical Package for the Social Sciences
SEM	Structural equation modelling
SN	Subjective Norm
T1	The first time data were collected
T2	The second time data were collected in the same study
T3	The third time data were collected in the same study
TAM	Original Technology acceptance model
TAM 2	Technology Acceptance Model 2
TAM 3	Technology Acceptance Model 3
TPB	Theory of planned behaviour
TRA	Theory of reasoned action
UAE	United Arab Emirates
UK	United Kingdom
USE	Use Behaviour
VOL	Voluntariness

1 CHAPTER ONE: INTRODUCTION

1.1. Introduction

This chapter describes the general acceptance and use of information technology (IT) in the Kingdom of Saudi Arabia (KSA), the Noor system, the background information on information technology in the KSA , the motivation and scope of the research, the research aims and objectives, the significance of the study, and the structure of the thesis. It ends with the conclusion to Chapter One.

1.2. Noor System

The Noor system (https://noor.moe.gov.sa) (see Figure 1-1) was acquired by the Ministry of Education in the KSA in 2010. It is an education management information system (EMIS) for managing information and educational data. It provides a range of 2763 e-Services, available anytime and anywhere, for 65 types of stakeholder/user, including teachers, principals, students, parents and ministry staff. It offers full functionality for schools and human resource administration within the MOE by providing statistics, reports and key performance indicators (KPIs) concerning education (ITU, 2013).

Figure 1-1: Noor System login website

The main aim of implementing the Noor system was to ensure accuracy, and high-quality outcomes among its stakeholders within a short period of time. Prior to the implementation of the Noor system, students had to wait for a period of five weeks before getting their results. Currently, students can review their grades a day after sitting their exams. Students enrolled in schools run by the Ministry of Education in the KSA, or based abroad, can access their grades anytime, anywhere, via the Noor system website (SPA, 2012). The Noor system won the World Summit on the Information Society (WSIS) Project Prize for the application of information and communication technology to e-Learning, on the 14th of May 2012. Over 170 projects from 50 countries were nominated for the prize (Abu-Ghazaleh, 2012).

The Noor system was chosen to be studied for several reasons. First, it has been applied widely across the KSA, with close to ten million users in both the organisational sector and the public sector, and therefore lends itself to being surveyed easily. Second, it is a complex system and cuts across different types of stakeholders/users, who use it for different purposes from management reporting to everyday school administration. Third, it offers the opportunity to apply Technology Acceptance Model 3 (TAM 3) to a uniform system, as opposed to previous studies that involved surveying participants using a range of technologies. Fourth, its results are likely to be more relevant in the context of the way technology is moving: that is, technology being confined to a purely organisational context, rather than being used more widely within organisational and non-organisational contexts. This will likely make the findings from the Noor system more applicable in the context of the KSA.

The main participants in the Noor study were teachers, students and parents. Figure 1-2, Figure 1-3 and Figure 1-4 show overviews of their respective main webpage accounts. Figure 1-2 represents the teachers' webpage. It is comprised of seven main sections: (1) the account holder's personal information, which is made up of four sub-sections; (2) the teaching timetable; (3) the students' behaviour and attendance records, which comprise two sub-sections; (4) late attendance and absence records; (5) the students' marks; (6) reports; and (7) exam timetables, which comprise nine sub-sections.

Figure 1-2: The Teachers’ Main Page on the Noor System.

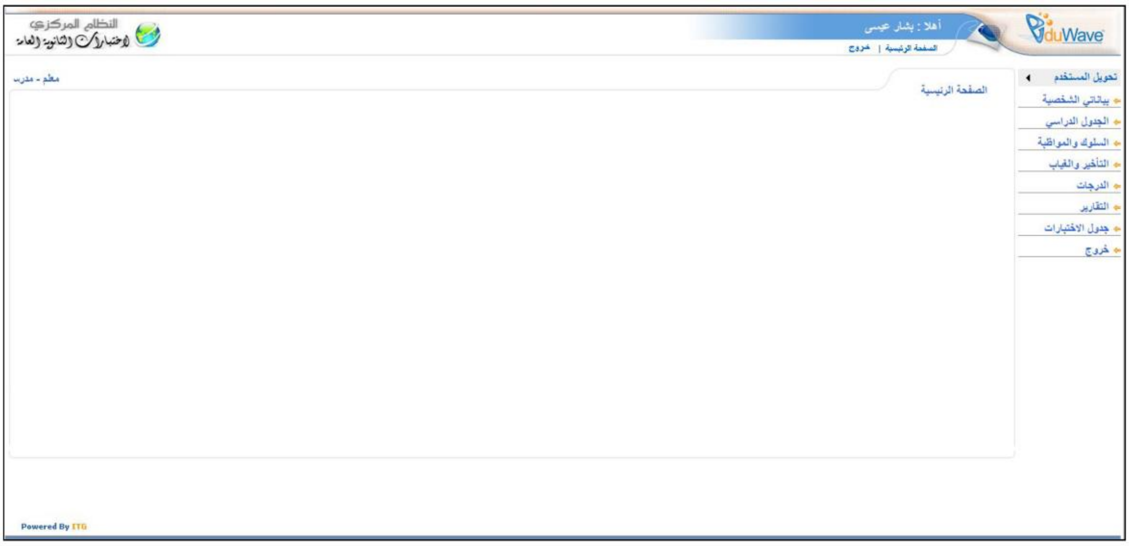


Figure 1-3 (below) shows the students’ account webpage. It has four main sections: (1) the account holder’s personal information, which comprises two sub-sections; (2) the lesson timetable; (3) the exam timetable; and (4) reports, which comprise three sub-sections.

Figure 1-3: The Students’ Main Page on the Noor System.

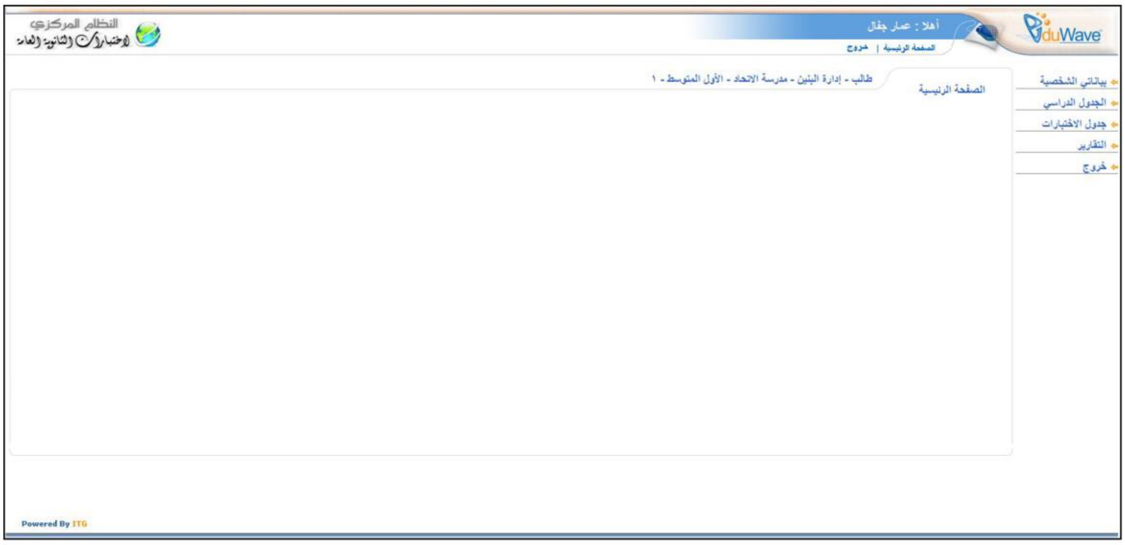
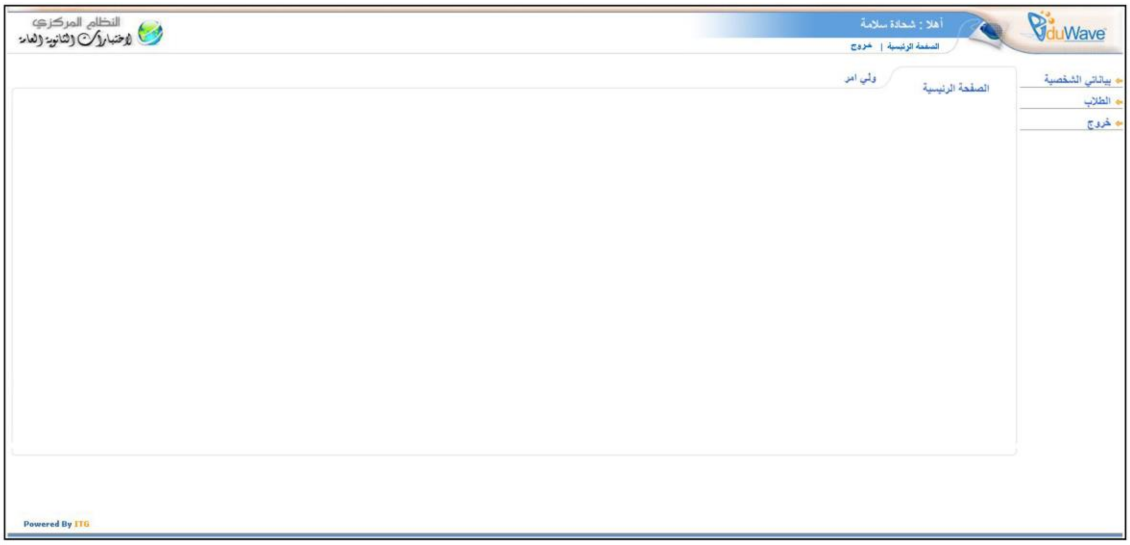


Figure 1-4 (below) shows the parents’ account webpage. It has two main sections: (1) the account holder’s personal information, which comprises two sub-sections, and (2) the students’ section. The students’ section is further categorised into three sub-sections: (1) exams, (2) lesson timetable, and (3) reports. The reports section is itself categorised into three sub-sections: (1)

attendance and absence reports, (2) attendance and absence statistics, and (3) late attendance statistics.

Figure 1-4: The Parents' Main Page on the Noor System.



1.3. Background on Information Technology in the Kingdom of Saudi Arabia

The KSA was founded according to the fundamentals of Islamic teachings and the Arabian culture. It was estimated to have a total population of about 31.7 million persons as of the year 2016 (GAStat, 2016). According to the 2016 demographics survey published by GAStat (2016), the population of Saudi nationals was 20.1 million. In 2000, the penetration rate of internet usage in the KSA was estimated at 2.2% (472,917 users); however, as of 1st July 2016, the estimate had grown to 64.7% with an estimated 20,813,695 internet users (Internet Live Stats, 2016). These statistics show that, between the years 2000 and 2016, there has been an exponential increase in the penetration rate of internet users in the KSA. Internet Live Stats (2016) defines an internet user as an *"individual who can access the Internet at home, via any device type and connection"*.

It is vital for governments and businesses to adopt information technology when making important and accurate decisions. While the mishandling of information technology can lead to the loss of money, its proper management can lead to increased profits for an organisation, government, or individual business. Thus, it is good practice to put in place the appropriate mechanisms and policies regarding the way information is collected, managed and processed. Similarly, it is necessary that proper attention is accorded to systems that perform key tasks, in order to maximise the benefits of the system adopted.

Since the 1980s, information systems in the KSA especially in the fields of IT, the telecommunications sector, and individual value-added businesses have witnessed a rapid growth due to the improved economy. Wood (2010) states that experts believe the total value of information and communications technology businesses in the KSA to have grown to £2 billion in 2010. This was expected to rise to £2.8 billion by 2014, making it the second highest revenue-earning sector, after petroleum. Similarly, the government of the KSA has been promoting its development goals using information technologies.

Developed countries are the main producers of information systems and technologies, which are thus often considered biased towards their own social and cultural development. Hill et al. (1998) suggest that difficulties arise when systems designed for developed countries are introduced in developing countries with different social and cultural customs. If the differences are poorly addressed and managed, there is the likelihood of a poor outcome or total failure when the systems are introduced. On the same note, a study conducted by Atiyyah (1989, p. 5) reported that, in the KSA, information technology is frequently hindered by technical, organisational and human problems:

> *Cultural conflicts between the organisation and management style of Western and Arab institutional leaders and workers have impacted the system development process and produced unsuccessful approaches to computer use and policy.*

This study investigates the applicability of a predictive model -TAM 3- for the measurement of technology acceptance in the Ministry of Education in the KSA. Attention has been paid to the key differences (cultural factors) in the KSA which might influence the acceptance of the Noor system in a positive or negative way. The following sections describe some of the existing studies within the KSA regarding e-Government, e-Commerce (shopping), e-Finance (banking), e-Health, and e-Education (learning).

1.3.1. e-Government

The Saudi Ministry of Education won a United Nations international award for its e-Learning application, the Noor system, as well an e-Government Achievement Award for education management for the e-Government program "Yesser". Noor provides e-services that directly serve teachers, parents, supervisors, and students, thus making the educational process in schools and educational departments more efficient regarding student registration, transfer, guidance and counselling services, educational supervision services, and educational training services.

E-Government initiatives based on information technology were first launched in the KSA in 2001, with the aim of using information and communication technology (ICT) *"as a tool to reform public organizations"* (Abanumy et al., 2005, p. 102). Among various recommendations, the authors' study proposed policies for accessing the web, and an enforcement procedure that would help the government to understand barriers that make the e-Government websites inaccessible to Saudis. Political, cultural, organisational, technological, and social issues were the main factors reported that would help in the transformation and adoption of e-Government services in the KSA (AL-Shehry et al., 2006).

The diffusion of innovation (DOI) theory was used to investigate factors that would influence user behaviour in adopting and using e-services in the KSA. Al-Ghaith et al. (2010) used multiple regression analysis to investigate the main predictors Perceived Ease of Use and Quality of internet which were reported to significantly influence the adoption of e-service, while a positive relationship was reported between privacy and the adoption of e-services. Relative Advantage was also reported to influence the adoption and usage of e-services. Regarding gender, Saudi women were reported to be more likely to adopt and use e-services than Saudi men.

An empirical study was conducted by interviewing government officials in the city of Madinah in the KSA. The study investigated the role played by intermediaries in helping e-Government diffusion in the KSA (Al-Sobhi and Weerakkody, 2010, p. 14). Online security issues were reported to hinder both government officials and citizens from embracing e-Government. Similarly, e-Government infrastructure was not evenly integrated to allow all government departments to use the e-Government portals with some government services not being available online. The authors noted that *"the establishment of intermediaries in KSA has not proven as successful as expected"*, and thus, availability, accessibility and enhancement of privacy and security were recommended as the main intermediaries that can play a significant role in the diffusion of e-services in the KSA.

Although the KSA has adopted e-Government and made it a top priority, several challenges have cropped up mainly due to technological, cultural, organisational, and social factors (Alshehri and Drew, 2010; Al-Sobhi et al., 2011). Alshehri and Drew (2010) proposed several measures to address some of these challenges :

- establishing a strong and modern information and communication technology infrastructure,
- addressing security and privacy issues with respect to information and communication technology,
- increasing citizens' awareness on e-Government services,
- training of government employees,
- creating professionally built and updated websites,
- training of top managers and leaders to support the adoption of information and communication technology,
- increasing collaboration and cooperation between government agencies,
- addressing cultural and social factors that may influence the adoption of information and communication technology in the KSA,
- and lastly, creating a strategic plan across all e-Government services.

In a study to investigate the influence of intermediaries on citizens' adoption of e-Government services in Madinah in the KSA, Al-Sobhi et al. (2011) used the unified theory of acceptance and use of technology (UTAUT) model. The study reported a significant relationship between Effort Expectance, Trust in Internet, Trust Intermediary, and e-Government Adoption Behaviour. Similarly, a significant relationship was reported between Facilitating Conditions and usage of e-Government services. The authors' study concludes that the better the facilitating conditions, the more the adoption challenges are minimized. This in turn enhances trust and, thus, encourages citizens' engagement in e-Government services.

The intention of citizens to adopt e-Government services in the KSA faces its own challenges. In their study, Alateyah et al. (2013, p. 601) integrated the Technology Acceptance Model (TAM), the DOI, and UTAUT models to investigate factors that might influence the adoption of e-Government services in KSA. The main factors identified as potentially influencing Saudis' intention to adopt e-Government services were "*quality of service, diffusion of innovation, computer and information literacy, culture, lack of awareness, technical infrastructure, website design, and security*".

The UTAUT was used to investigate the role of intermediaries (e-offices) in facilitating the adoption and diffusion of the traffic department's e-Government services in Madinah in the KSA (Weerakkody et al., 2013). Performance Expectancy, Effort Expectancy, and Trust in Intermediaries were all reported to have a positive and significant influence on Behavioural Intention to use e-Government, which in turn influenced Use Behaviour of e-Government via intermediaries. Social Influence and Trust in Internet had no significant causal effect on the Behavioural Intention influencing the Use Behaviour governing the use of e-Government services through e-offices. Thus, e-offices were concluded to be vital platforms that can improve trust and facilitate the adoption and diffusion of e-Government services in the KSA.

1.3.2. e-Commerce (shopping)

A model was used based on the theory of planned behaviour (TPB) and the DOI to investigate the adoption of and perspectives on e-Commerce in the KSA. Relative advantage of e-Commerce and internet banking were reported to influence the adoption of e-Commerce (Sait et al., 2004). Attitude and Perceived Behavioural Control were reported to significantly influence the adoption of e-Commerce in the KSA. Males were reported to be more likely to adopt e-Commerce compared to females. It was also evident that people living in major cities had a higher affinity towards the adoption of e-Commerce compared with people living in smaller cities or towns. Finally, intention to adopt e-Commerce was reported to be significantly influenced by the number of computers and technological gadgets one has at home.

Perceived Enjoyment, Perceived Usefulness, and Subjective Norm were reported to be the core determinants for the continuance of e-shopping intentions among women in the KSA (Al-Maghrabi and Dennis, 2009). Using TAM in the study, the authors noted that Perceived Enjoyment had the most influence on continued e-shopping intentions, with a direct effect on women no matter if their spending habits were high or low. Perceived Enjoyment was followed by Subjective Norm, and then Perceived Usefulness.

In another study, the theory of reasoned action (TRA) model was adopted, along with the TPB model to investigate the determinants for e-Commerce customer satisfaction, trust and loyalty among business-to-customer (B2C) e-Commerce customers from the Eastern Province of the KSA (Eid, 2011). The author's study noted that B2C e-Commerce Customer loyalty was greatly influenced by Customer Satisfaction, although Customer Trust had a weak influence on B2C e-Commerce use. Similarly, Perceived Security Risk and Perceived Privacy were weak determinants of e-Commerce Service Satisfaction but strong determinants of Trust in e-Commerce service. Quality of User Interface was shown to positively influence Trust, while Information Quality was reported to be a weak determinant of Trust. Customer Loyalty was also reported to significantly influence User Interface Quality and Information Quality. In summary, User Interface Quality and Information Quality greatly influenced online Customer Satisfaction and Loyalty, while use of e-Commerce websites were greatly influenced by security and privacy issues, and user interface design quality.

E-Commerce adoption and the factors that influence it have been investigated by organisations within the KSA (Al-Hudhaif and Alkubeyyer, 2011). The Perceived e-Readiness model (PERM) was adapted for the study. The model had two major constructs: Perceived Organisational e-Readiness (POER) and Perceived External e-Readiness (PEER). The constructs of the PERM model addressed innovation, management, organisation, and environmental factors. The Perceived Organisational e-Readiness factors were reported to influence the institutionalisation of e-Commerce positively. Similarly, the Perceived External e-Readiness factors were reported to influence the initial adoption of e-Commerce positively. In summary, the authors noted that environmental factors had the highest likelihood of influencing the initial adoption of e-Commerce in the KSA, while internal organisation factors were the main determinants of e-Commerce adoption.

The organisational, technical, and environmental (OTE) model has also been applied to investigate e-Commerce adoption among owners/managers of small and medium enterprises (SMEs) in the KSA (Almoawi and Mahmood, 2011). The OTE model proposes that organisation, technical, and environmental factors influence the adoption of e-Commerce. Multiple regression analysis was used as the main analytical approach. Attitude, Competition Intensity, Information Intensity, and Size of Firm were the strongest, positive and significant predictors of e-Commerce adoption in the KSA, while Relative Advantage and Owner's Knowledge were reported as significant negative predictors. Complexity of Technology, Owner's Innovativeness, and Compatibility had no significant effect on the adoption of e-Commerce.

A preliminary study was conducted to investigate the diffusion of e-Commerce and factors that influenced its adoption among 16 retailers in the KSA (AlGhamdi et al., 2011). The authors used the DOI, with its five perceived attributes: Relative Advantage, Compatibility, Complexity, Trialability and

Observability. Among the 16 retailers, cultural and technical issues were highlighted as some of the main challenges to e-Commerce. The authors recommended the adoption of facilitating factors to overcome the main challenges. Some of the facilitating factors were as follows: promotion of educational programmes and public awareness of e-Commerce, e-Commerce support and assistance by the KSA government; creation of trustworthy and secure online payment platforms; improvement of information and communication technology infrastructure; and provision of the retailers with an e-Commerce software sample for trial. A year later, AlGhamdi et al. (2012) presented their actual finding on the diffusion and adoption of online retailing in the KSA. In their summary, the authors listed the main challenges impeding the adoption of e-Commerce by retailers in the KSA as follows: lack of enthusiasm from consumers regarding online business transactions, lack of clear legislation and rules on e-Commerce, and lack of experience of e-Commerce. Online payments through trustworthy and secure platforms, enhanced information and communication technology infrastructure, e-Commerce awareness programmes, and government regulation and support were all recommended as part of a larger framework that should motivate retailers to adopt e-Commerce in the KSA.

A revised TAM was integrated with expectation confirmation theory to investigate the influence of age on the continuance of intentions towards e-shopping in the KSA (Al-Maghrabi et al., 2011). Perceived Enjoyment, Subjective Norm, and Perceived Usefulness were reported as the main constructs influencing continuance of intentions towards e-shopping. Perceived Enjoyment was reported to be the strongest predictor when compared to Perceived Usefulness and Subjective Norm. Younger people were reported to be influenced more by evaluations of other people’s opinions. Site Quality and Trust showed large indirect effects on Continuance of Intentions, prompting the authors to conclude that the Saudis only trust people within their in-group. Younger people were also reported to be influenced more by Trust, Enjoyment and Continuance of Intentions compared to the older generation.

Another study used the OTE model to investigate e-Commerce adoption amongSMEs in the KSA. The authors noted that the level of e-Commerce usage was very low, and that it was necessary to improve customer readiness for online purchases, in order for the KSA to be ranked among the mature e-Commerce nations of the world (Al-Somali et al., 2013).

The extended e-Commerce TAM was used to investigate perceptions of risk regarding internet shopping among Americans and Saudi Arabians (Brosdahl and Almousa, 2013). Attitude, Intention, Perceived Usefulness, and Perceived Ease of Use were reported to be significantly higher for the Americans than for the Saudis. Fewer Saudis were reported to shop online. The Saudis' collectivist culture was reported to explain the higher level of risk perception and, thus, the reluctance to shop online. The Saudis perceived the financial aspects of shopping online to be very risky and they similarly scored a higher mean score on psychological risk, due to their inexperience with online shopping. Social risks in terms of peer influence, family and friends were reported to influence their online shopping.

1.3.3. e-Finance (banking)

A cross-market examination using the internet banking acceptance model (IBAM) (a revised TAM) was conducted by Alsajjan and Dennis (2010) on university students in the KSA and the United Kingdom. The authors used Perceived Manageability, Subjective Norm, Trust Beliefs and Perceived Usefulness to investigate Attitudinal Intentions towards consumers' acceptance of internet banking. The findings revealed that Perceived Usefulness influenced Attitudinal Intentions the most among the Saudi respondents than among British respondents. Attitudinal Intentions were reported to be a vital predictor for Adoption Behaviour, whereas Subjective Norm was reported to influence e-Banking behaviour indirectly in both study groups.

1.3.4. e-Health

A new model for e-Health diffusion in the KSA was proposed (Altuwaijri, 2008, p. 176). The new model was based on *"the theory of diffusion of innovations, the theory of barriers to innovation, the studies of critical success factors, and the advancement of project theories"*. The author recommended that knowledge barriers to IT innovation diffusion be tackled based on the following categories: economic, technical, organisational, and behavioural barriers.

1.3.5. e-Education (learning)

The computer attitude scales (CAS) developed by Loyd and Gressard (1984); Loyd and Loyd (1985), were used to investigate the influence of Computer Anxiety, Computer Confidence, Computer Liking, Perceived Computer Usefulness and Computer Utilisation on Computer Attitude in major educational institutions in the KSA (Al-Khaldi and Al-Jabri, 1998). The study reported that Computer Anxiety, Computer Confidence, Computer Liking, and Perceived Computer Usefulness were significantly associated with computer use in educational institutions in the KSA.

Another study adopted the DOI to investigate the use of the internet by teachers of English as a foreign language (EFL) in Saudi Arabian colleges of technology (Al-Asmari, 2005, p. 149). The study investigated their personal characteristics, and used the Level of Internet Access, Perceived Computer and Internet Expertise, and Perception of Internet as the main constructs in the model. The results revealed that reduced computer infrastructure, a lack of access to computers, and insufficient computer skills training hamper the use of the internet in English as a foreign language (EFL) teaching in the KSA. The study noted a gap between the level of interest in internet operations and the opportunity to learn or implement internet-based instructions. While the EFL teachers showed limited use of the internet, they exhibited positive perceptions of the use of the internet for pedagogical purpose: *"EFL teachers were not in a position to widely implement Internet use in language instruction although they seemed ready for that".*

In another study, Albalawi (2007, p. 90 & 92) investigated the critical factors that would influence the implementation of web-based instruction in the KSA by the higher-education faculties at three universities. The faculties' attitudes towards web-based instruction was reported to be positive, and the study concluded that online courses were the future of higher education in the KSA. A number of barriers to web-based instruction were also identified, namely:

> *Lack of clear knowledge on how to develop web-based instructions, lack of enough time to develop web-based instructions, lack of clear web-based instructions policies, lack of clear course ownership policies, lack of peer support, lack of technical support, lack of monetary incentive, lack of administrative support, and lack of governmental support*.

However, the author also reported that *"Saudi faculty had positive views about potential incentives when implementing web-based instructions*".

Al-Fahad (2009) has reported on female students' attitudes and perceptions towards the use of mobile technology in education. Using mobile phones would enrich student learning by facilitating timely information and the promotion of distance learning. However, the high communication costs involved in mobile learning were considered the main challenge to distance learning. Perceptions concerning the use of mobile learning were found to be supportive among most students. The availability of wireless networks was believed to increase the flexibility of access to learning resources. Laptops, mobile phones and personal digital assistants (PDAs) were the main avenues chosen to facilitate m-Learning by the students.

In another study, it was reported that universities in the KSA were among the universal universities implementing e-Learning (Alenezi et al., 2010). An extended TAM was designed to investigate the effect of Perceived Enjoyment, Computer Self-Efficacy, Computer Anxiety, and Internet Experience on Saudi university students' intention to use e-Learning. A stepwise regression method was adopted as the main analytical method. Attitude was reported to have a mediation effect on both Perceived Ease of Use and Perceived Usefulness towards users' Behavioural Intention. Perceived Enjoyment, Computer Anxiety, and Computer Self-Efficacy were reported to have a significant and direct effect on students' intention to use e-Learning. However, Internet Experience was reported to be insignificant and, thus, had no influence on students' intention to use e-Learning.

Alebaikan and Troudi (2010), used the theory of blended learning designs to investigate the challenges and attitudes towards blended learning in Saudi universities. Adapting blended learning to the traditional university culture was reported to be the main challenge in Saudi higher education. Similarly, finding the right design of blended learning and addressing the time issue were crucial challenges facing blended learning implementation. To address these challenges, the authors recommended a transition to a blended learning university environment, involving the following: offering orientation for new students and instructors, establishing computer laboratories for students, introducing training programs for instructors, designing a series of easy-to-use curricula for instructors, and lastly, utilizing students' and instructors' feedback to accurately inform university action plans for blended learning.

Similarly, Alebaikan (2011), used the theoretical blended learning framework design to investigate the implementation of blended learning in Saudi universities. The theory is based on five factors: the blended concept; implementation and support; ethical considerations; the blended pedagogy; and evaluation and development. Nevertheless, the author reported a low level of knowledge about blended learning in the KSA higher education. The traditional didactic environment was reported to pose certain challenges in adapting blended learning to Saudi universities and the study recommended the prioritisation of developing training programmes for both students and lecturers to address the issue of lack of technical skills.

The intention to accept and use e-Learning among university students at King Abdul Aziz University in Jeddah in the KSA was investigated by Al-Harbi (2011, p. 42). Attitude was reported to influence the Behavioural Intention to use e-Learning. The author further noted, *"Students' who hold favourable attitude*s *about using e-Learning are more inclined to accept and use e-Learning"*. Subjective Norm was also reported to influence students' decisions regarding the use of e-Learning. Behavioural Intention to accept e-Learning was reported to be influenced by Perceived e-Learning Accessibility, whereas Perceptions of e-Learning Usefulness and Ease of Use were reported to significantly influence Attitude towards e-Learning.

E-learning has its own limitations and higher education programmes offered using e-Learning in the KSA are no exception. Ahmed et al. (2011) reported that the risk of unethical learning practices, violations of privacy, plagiarism, and spying all lead to security concerns in cyberspace. To effectively address some of the security issues relating to e-Learning in the KSA higher education programmes, Ahmed et al. (2011) recommended the adoption of user authorisation and authentication; the minimization of e-Learning ‘entry points’; the maintenance of a strict session system and verification of students’ credentials; the use of encryption, digital signatures and firewalls to curb system manipulation by students; controlled user (legitimate users) access to authorised contents, allowing only authorised users to modify the contents; the availing of content to learners at specified sessions only; and lastly, non-repudiation (that is, providing learners with e-Learning services to avoid fraud, in case of Trojan horses or virus attacks, thus preventing the manipulation of systems during an attack).

Asiri et al. (2012) have presented a theoretical framework, based on the assumptions of the TRA and TAM models, to investigate the factors influencing the utilisation of the Jusur Learning Management System (Jusur LMS) at various public universities in the KSA. The main factors incorporated in the theoretical model were attitude towards Jusur LMS and competence level in using Jusur LMS. Pedagogical beliefs concerning Jusur LMS e-Learning were theorised as the main determinant that would incorporate Jusur LMS into the teaching environment. The frequency of using Jusur LMS was also theorised to relate to positive beliefs regarding Jusur LMS e-Learning in the KSA. Organisational, technological and social barriers were theorised as the main external barriers that might hinder faculty members from using Jusur LMS e-Learning. Gender, computer experience and training were theorised as the main demographic characteristics that were likely to influence the adoption and use of Jusur LMS e-Learning in the KSA.

A modified version of the UTAUT model was used to investigate the factors that would influence the intentions of higher education students in the KSA towards the use of m-Learning (Nassuora, 2012). Performance Expectancy, Effort Expectancy, Social Factors, and Facilitating Conditions were the main constructs used to investigate both Behavioural Intention towards the use of m-Learning, and the Attitude towards the behavioural use of m-Learning. Social Factors and Facilitating Conditions had a positive and significant influence on Attitude towards the use of m-Learning. Performance Expectancy and Effort Expectancy had a significant influence on Attitude towards the use of m-Learning. Performance Expectancy and Effort Expectancy also had a positive influence on Intention to use m-Learning, whereas Social Factors and Facilitating Conditions had no significant influence on Intention to use m-Learning. Finally, the authors noted that Attitude towards the use of m-Learning had a positive and significant influence on Intention to use m-Learning among higher education students in the KSA.

A further study extended the classical TAM through the inclusion of the Perceived ICT Innovativeness and ICT Anxiety, in order to investigate the Behavioural Intention to use smartphones and tablets for educational purposes among Saudi students (Seliaman and Al-Turki, 2012). The main constructs used in the study were Perceived Innovativeness and Information and Communication Technology Anxiety, Perceived Ease of Use, Perceived Usefulness, Attitude towards using smartphones or tablets, and Intention to use. The preliminary findings suggested the lack of a high positive correlation between Perceived Usefulness and the use of m-Learning. Nevertheless, Perceived Innovativeness was reported to have a positive influence on Behavioural Intention to use m-Learning.

1.4. Motivation for this Research

The Noor system is currently shifting the way teachers approach their job-related tasks, from a manual approach to one based on more advanced IS. It also offers students the opportunity to monitor the progress of their studies and exams and enables parents to follow the academic progress of their children. Heavy or prolonged use does not necessarily guarantee that the system will be a success, and thus predicting whether the system will be accepted and used by the users is among the main tasks of IS research (Mardiana et al., 2015). Besides, the acceptance, adoption, and use of technology at an individual level are ripe topics in the information systems literature (Rondan-Cataluña et al., 2015), as is the nature of constantly changing IT environments (Benbasat and Barki, 2007), while the ways in which individuals adopt and use information systems is an enduring question in the field of IS (Hirschheim, 2007). TAM 3 can predict the Behavioural Intention to use an information system, as well as predicting its related Use Behaviour. However, these two phenomena have not yet been investigated in the KSA under two different system usage settings within an educational context. Therefore, due to the rapid growth and changes in IS, it was deemed worthwhile to investigate the acceptability of the Noor system.

During his presentation at the 2015 World Summit on the Information Society in Switzerland, the Chief Information Officer of the Ministry of Education stated that the system was initially adopted in 2010 (AL-Ghamdi, 2015). However, he also acknowledged that, at the time of his presentation, the implementation of the system was still in Phase 3, which was supposed to have ended in 2012. Likewise, in May 2013, he gave a presentation at the Arab Education Summit in Jordan and confirmed that the implementation of the Noor system was only 70% complete (AES, 2013). Although he did not mention the challenges that might have slowed down the implementation process, this was probably due to cultural factors. It was obvious that the implementation process was facing its own challenges. This study aims to identify these unexplained gaps in terms of challenges that are worth investigating, using TAM 3.

1.5. Scope of the Research

The Noor system is an education management information system that was acquired in 2010 by the government of the KSA to manage information and educational data in the Ministry of Education. It is mainly used by teachers, students and parents; government officials also use it to monitor education statistics, reports, and key performance indicators relating to education in the KSA. Due to its wide range of e-services, the scope of the research focuses on the applicability of TAM 3 to the implementation of the Noor system in the KSA, considering its users under both mandatory and voluntary settings, the role that socio-demographics can play in its adoption, and the cultural influences affecting its use. It is worth mentioning that the results of this research are based on both Saudi and non-Saudi populations. The KSA has many immigrant residents who have been categorised in this study as non-Saudi. Thus, this research focuses only on the registered users of the Noor system. Lastly, the participants of the research sample are teachers, parents and secondary school students. None of the participants of the research are from the Ministry of Education, and neither are Noor officials or administrators included.

1.6. Research Aim and Objectives

The main aim of the current study was to investigate the applicability of TAM 3 to the use of a specific IS system—that is, the Noor system—in an educational context in the KSA. This involved investigating how TAM 3's antecedents and moderators affected technology acceptance in the context being investigated.

Several key objectives were defined as requirements to achieve the primary aim, as follows:

1. To test the appropriateness of the Noor system to the KSA using TAM 3.

2. To compare the applicability of TAM 3 to the Noor system among organisational users (mandatory) and among public/non-organisational users (voluntary) in the KSA.

3. To explore the role that demographic moderators can play in the acceptance of the Noor system by testing TAM 3.

4. To investigate the influence that Saudi culture has on the Behavioural Intention to use the Noor system, as well as its Perceived Usefulness.

5. To investigate the effect of retaining or discarding Use Behaviour as the main dependent variable in TAM 3 for a self-reported system usage.

1.7. Significance of the Research

The literature review for TAM 3 highlighted the lack of research available on the applicability of the Noor system to the KSA. Studies by Venkatesh and Bala (2008); Al-Gahtani (2016), have tested TAM 3 within the Western and Saudi contexts, respectively. The study by Venkatesh and Bala (2008) was longitudinal, testing four different information systems within a period of five months but combining their results. The study by Al-Gahtani (2016) was cross-sectional; however, upon closer review, his comparative reporting using Venkatesh and Bala (2008) findings on the Perceived Ease of Use, Perceived Usefulness, and Behavioural Intention were not correct. Al-Gahtani (2016) used the values that Venkatesh and Bala (2008) reported from their T3 period. Since his study was cross-sectional, the least Al-Gahtani (2016) could have done would have been to use the T1 results from Venkatesh and Bala (2008) as his comparative *beta* estimate values. This cannot be considered good practice; the two studies used different research methodologies, showing a flaw in the reporting of the findings. Al-Gahtani (2016) study also only investigated the Saudi population, although it is known that there are non-Saudi students in the KSA.

The present study can be considered an improvement on Venkatesh and Bala (2008), and Al-Gahtani (2016), for a number of reasons. (1) It is cross-sectional, and the data were collected using a survey. The above two studies used manual data collection which has more limitations than an online survey. (2) This study focuses on a single information system, unlike Venkatesh and Bala (2008) study that investigated four different operating systems within four different sectors. (3) Al-Gahtani (2016) findings were based on the findings that Venkatesh and Bala (2008) reported for the third period of their data collection. Thus, the comparative analysis done by Al-Gahtani (2016) cannot be considered correct because his study was cross-sectional, while Venkatesh and Bala (2008) was longitudinal. (4) The present study compares TAM 3 hypotheses for two non-Western contexts: that is, the Saudi and non-Saudi populations. This comparison is very rich in terms of understanding the influence of culture on the users of the Noor system. Thus, the main outcomes of the research can be used to assess the impact of the Noor system beyond the borders of the KSA, because most of the Middle Eastern countries have very similar educational IT systems (even though the Noor system has been reported to be particularly comprehensive, and has won several international awards).

1.8. Structure of the Thesis

The structure of this thesis is based on 10 chapters:

Chapter One: Introduction—This chapter will present the research background, an overview of information technology in the KSA, an overview of the Noor system, the research questions, the aim and objectives, the motivations for the research, the scope of the research, the significance of the research, and a conclusion.

Chapter Two: Literature Review—This chapter will present the research background for studies conducted on the adoption of information technology, a discussion of TAM in relation to other approaches to evaluating technology acceptance, a review of TAM 3 studies, a discussion of the evolution and application of TAM 3 studies both inside Middle Eastern and outside the Middle East, and finally, a conclusion.

Chapter Three: Theoretical Background and Hypotheses Development—The purpose of this chapter is to build an understanding of how the hypotheses were developed and how this was supported by the literature. The 16 main hypotheses are developed using literature reviews of studies that use the TAM. Likewise, a number of sub-hypotheses on the effect of socio-demographics on Subjective Norm are mentioned. The findings of the literature will back up the argument and inferences throughout the thesis; lastly, a conclusion ends Chapter Three.

Chapter Four: Research Methodology—This chapter outlines the research methodology adopted to investigate the research aim and the four objectives stated in Chapter One. This chapter gives an overview of the research approach and design, the sampling procedures and designs, the reliability and validity of the questionnaire, the questionnaire’s design, the translations, the pilot survey, the development of the questionnaires, the distribution of the questionnaires, the data screening, and the structural equation modelling. Lastly, some concluding remarks are made.

Chapter Five: Structural Equation Modelling of the Noor System—This chapter presents the main data analysis that was conducted in the study. The analysis is categorised into three groups: teachers, students, and parents. This chapter likewise presents the comparative hypotheses testing the 16 main hypotheses, and finally, some concluding remarks.

Chapter Six: Moderation and Interaction Testing—This chapter presents the findings of the moderation and interaction testing. The chapter starts by discussing the findings of the moderation testing for Groups, Nationality, Gender, Internet Proficiency, Internet Access at Home, Internet Access at Work, Internet Experience, Age, and Educational Level. Likewise, the comparative hypotheses based on the three groups and their moderation interactions are investigated, followed by concluding remarks. The AMOS software add-in was used to test the main relationships, moderation testing, and their interactions, while the SPSS software package was used to analyse the effect size of the socio-demographic variables on the hypotheses.

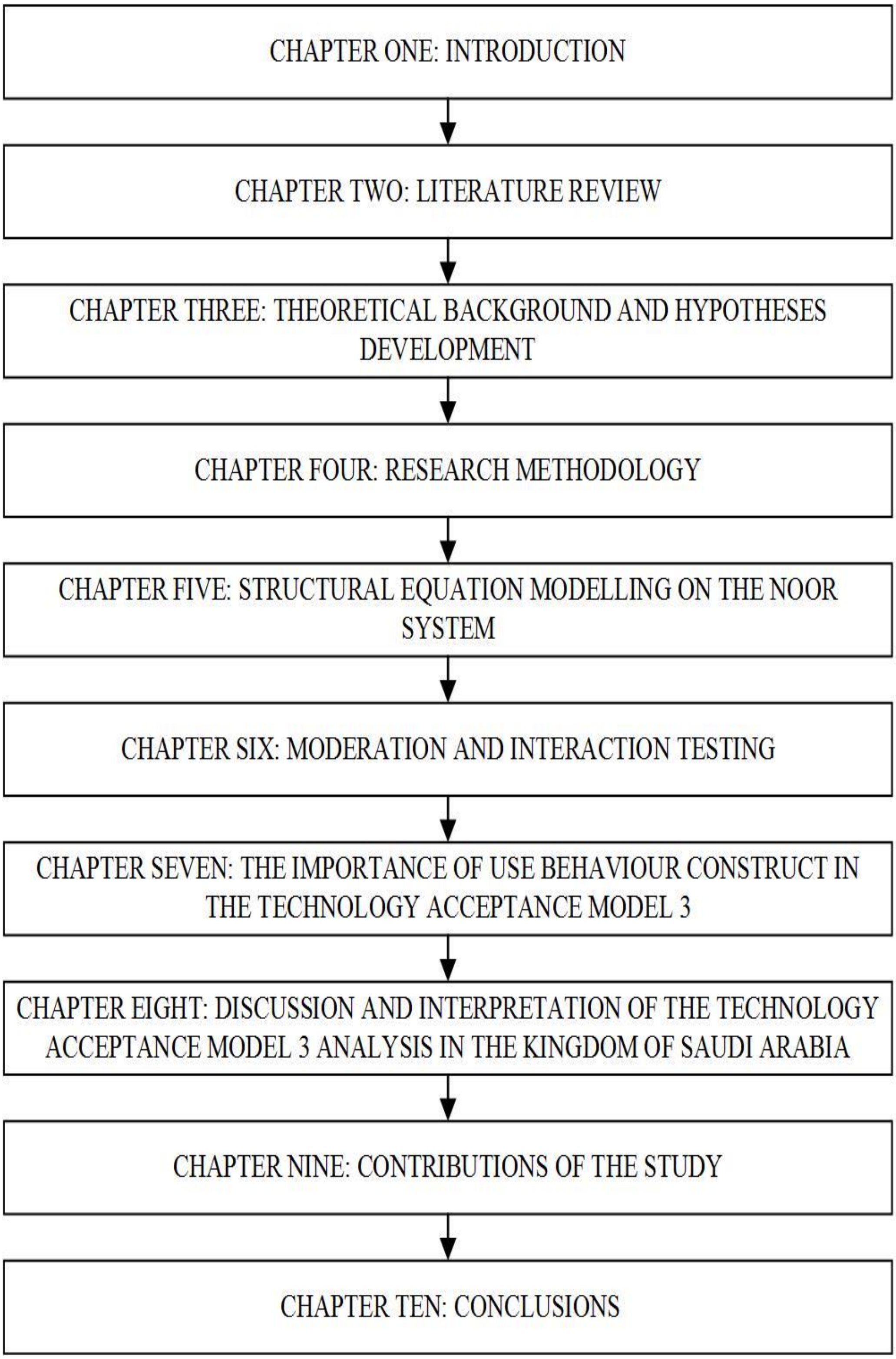
Chapter Seven: The Importance of the Use Behaviour Construct in TAM 3—This chapter presents the findings on the importance of retaining the Use Behaviour construct in TAM 3. The chapter starts by comparing the effects of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention. The relative fit indices, factor loadings, beta estimates, and variance explained are compared for the final model used in the current study with the Use Behaviour construct and for the model without the Use Behaviour construct. Finally, some concluding remarks are made.

Chapter Eight: Discussion and Interpretation of the TAM 3 Analysis for the KSA—This study has five main objectives that were pursued. The arguments and inferences from the main findings are supported by the literature. However, it is worth noting that the comparison between the Saudi and non-Saudi was interpreted based on the effect size of the main relationships. Lastly, concluding remarks on Chapter Eight are made.

Chapter Nine: Contributions of the Study—This chapter presents the contributions that this study has made to the existing literature regarding TAM 3. The gaps identified from the literature review are investigated. The contributions are categorised into three main groups: contributions relating to the 16 hypotheses, contributions concerning the relationship between the socio-demographics used in the study of Subjective Norm, and contributions concerning the importance of measuring the Use Behaviour construct in TAM 3. The chapter closes with a conclusion.

Chapter Ten: Conclusions—This chapter presents a summative overview of the findings of this study. The chapter addresses the main findings of the study based on the five objectives, it revisits the question designs, and it describes the limitations of the study. Recommendations and suggestions for further research are then discussed. Lastly, concluding remarks on the entire study are made (see Figure 1-5).

Figure 1-5: Research Outline



1.9. Conclusion

In this chapter, the different types of information technologies that are available in the KSA have been described. A brief introduction to the Noor system has been given. The purpose of the current study was to investigate the suitability of using TAM 3 in the KSA in an educational context using the Noor system. The five main objectives that are being pursued in the current study have thus been outlined in this chapter.

This chapter's brief introduction to information systems in the KSA focused on the fields of e-Health, e-Learning, e-Banking, e-Government, and e-Commerce. The studies cited from the KSA highlighted some key cultural differences that might influence the acceptance and applicability of the Noor system either positively or negatively. A brief history of the development and adoption of the Noor system was also described. Prior to the inception of the Noor system in 2010, the management of information and educational data in the Ministry of Education (MOE) was done manually.

In addition, this chapter presented screenshots of the Noor system website accounts for parents, teachers, and students. However, the language appearing on the screenshots is Arabic, since this is the official language of the KSA. The next chapter will present a literature review related to the adoption of information technology, previous models that have been applied in studying technology acceptance, and theories of individual acceptance.

2 CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

The purpose of this chapter is to review the models and theories of individual acceptance, and the technology acceptance models in relation to other approaches to evaluating technology acceptance. The chapter includes a review of TAM 3 studies, a discussion of the evolution and application of TAM in the Middle East, a critical reflection and analysis of TAM 3, and the identification of research gaps in the TAM3 literature.

In the field of governance and the provision of public services, the acceptance and use of technology can facilitate development, especially in developing nations. It is thus very necessary to promote the acceptance and use of technology in developing nations, and thereby accelerate their integration into the global environment. It is important to predict the level of accuracy of different information technological systems in all walks of life, especially the compatibility of information systems in different areas of life in developing nations. Venkatesh and Bala (2008) explain that the ability to determine the suitability of new technology helps save money that could otherwise be wasted on technology that people will not use or that will be under-utilised.

Regarding different organisational settings, numerous models for the prediction and measurement of technology acceptance have been developed. However, the application of these models as predictive tools for the measurement of technology acceptance and usage is far more advanced in developed nations compared with developing nations. Among the various models and theories of individual acceptance, such as the TRA and UTAUT, TAM is one of the most widely accepted, although it has undergone several extensions since 1986 when it was first proposed. Most of the extensions to the original model were proposed as a result of significant research studies conducted in developed countries. In their study, Anderson et al. (2008) state that, due to the changes in the global economy and the need by multinational organisations to extend their research in information technology, more studies using the extended TAM are being conducted in developing nations.

Due to the increase in adoption failures of information systems (IS) by organisations since the 1970s, there has been increased pressure for researchers to develop better models and techniques that can assist IS developers and designers in developing a successful IS. The studies conducted by Al-Khaldi and Wallace (1999); Al-Gahtani (2004), reported that individual attitudes among Saudis are strongly influenced by the utilisation of personal computers in their workplaces. Al-Khaldi and Wallace (1999) further point out that, alongside individual attitudes, people's experience of using personal computers, access to personal computers, and other social factors also determine the utilisation of personal computers in the KSA.

According to Sait et al. (2003), information technology has been adopted in various fields, such as finance, industry, commerce, education, government services, and healthcare, thus promoting import, trade and industrial activities. Al-Gahtani (2004, p. 18) has investigated the success factors of computer technology acceptance in the KSAa and reported that Saudi users have a low computer acceptance rate compared to foreigners. The author attributed this finding to Saudis' being *"technologically anxious"*.

Multiple regression analysis has been used to investigate factors affecting the adoption of broadband in the KSA (Kolsaker et al., 2007). The authors used the following constructs in the study: Relative Advantage, Perceived Usefulness, Resources, Service Quality, Skills, Compatibility, and Social Cultural factors. The regression results revealed that only Perceived Usefulness, Service Quality, age, type of connection, and type of accommodation had a significant influence on Attitude towards the adoption of broadband. The remaining variables had an insignificant influence on Attitude towards broadband technology.

The impact of internet use in the KSA was investigated by Sait and Al-Tawil (2007, p. 30). The study reported the need to improve internet diffusion among Saudi females, through targeted trainings, awareness programmes, and the establishment of internet access centres exclusively for women. The Arabiccentred education system in the KSA was also reported to be a major hindrance to the expansion of internet use in academic institutions, especially among young people, due to the *"absence of English as a language supported by the school system*". Arabic online content was described as "*very scarce*". Finally, high internet costs were also associated with a lack of internet use among the self-employed and entrepreneurs.

2.1.1. Information Technology Acceptance

According to Gattiker (1990, p. 6) description, technology acceptance is "*an individual's psychological state in respect to his or her voluntary or intended use of a particular technology*". Advances in computer technology have been associated with the rapid growth of end-user computing, making the end-user systems economically attractive as stated by Davis (1986). This makes these systems an essential tool for enhancing the competitiveness of a country's economy, as pointed out by Oliveira and Martins (2010); it also changes the way people meet and communicate (Lee et al., 2003). Nearly all activities in the 21st century in almost every sector are directly or indirectly influenced by information technology. They span from telecommunications, to the banking sector, education (DeLacey and Leonard (2002); Radcliffe (2002), medicine (Chau and Hu (2001), and many more. Workplaces and practices have been transformed by information technology (IT), due to the increase in the possession and utilisation of mobile phones, networked technologies, and other internet facilities (Radcliffe, 2002). As noted by Agarwal (2000), in the modern global, digital, and networked economies, corporate expenditures and organisational dependencies on IT is rising at a high rate. It has also been reported that organisational investment in IT is on the rise, as its adoption and usage are critical for enhancing its associated productivity benefits (Karahanna et al., 1999).

Most of the primary IT adoption decisions are made by the senior management of an organisation, thus neglecting the individual employees of the firm, who are the ultimate users and consumers of IT. This poses some challenges as the true value of a business can only boom through its appropriate use by its target user group (Agarwal, 2000).

2.1.2. The Models and Theories of Individual Acceptance

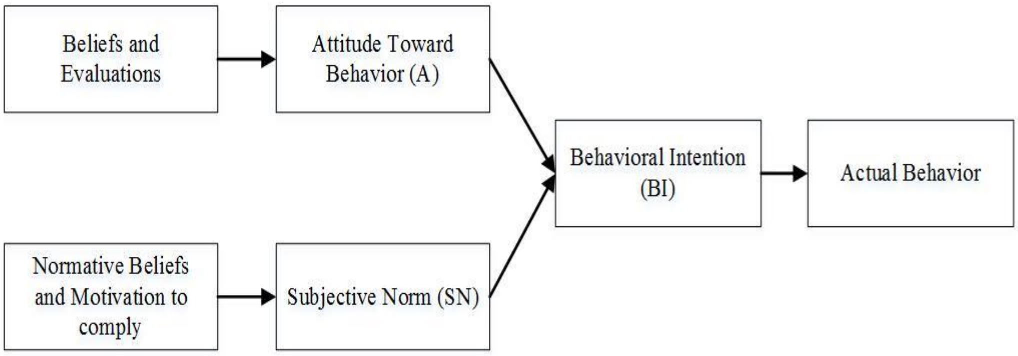
According to Dillon and Morris (1996, p. 7), "*user acceptance has been conceptualised as an outcome variable in a psychological process that users go through in making decisions about technology*". The adoption of IT can result in varying behaviour responses from individual users when faced with the new information technology applications (Agarwal, 2000). Most of the concepts of IT acceptance have been adopted from social psychology theories, such as the TRA, the TPB, the DOI, and the social cognitive theory (SCT). According to Agarwal (2000), the TRA and the TPB generalise a large spectrum of individual behaviour between them. The utilisation of IT is a case in which behaviour influences the intentions of an individual to perform the behaviour; these two models adopt intentions in order to use IT as the dependent variable.

2.1.2.1. Theory of Reasoned Action

The TRA was developed by Ajzen (1967), who collaborated with Fishbein in the early 1970s to expand the theory. In the 1980s, human behaviour was studied using the TRA with appropriate interventions made by Ajzen and Fishbein (1988), and the theory has been extensively used in predicting and explaining the behaviour determinants of computer usage.

The TRA has been widely used in social psychology; its main emphasis is on the determinants of consciously intended behaviours (Davis et al., 1989) . TRA model (as shown in Figure 2-1) shows how the performance of a specific behaviour by a person is determined by their Behavioural Intention which can likewise be determined by the person's attitude and the Subjective Norm that relates to that specific behaviour.

Figure 2-1: Theory of Reasoned Action (Davis et al., 1989, p. 984).



Fishbein and Ajzen (1975) define Attitude as a person's positive or negative feelings concerning the performance of the actual behaviour, while they define Behavioural Intention as a measure of one's intention to perform a behaviour.

According to Downs and Hausenblas (2005, p. 77), "*the main TRA assumption is that people will engage in a behaviour when they have a high Intention, and their Intention is increased when they evaluate a behaviour positively (Attitude) and believe that significant others want them to engage in it*".

The TRA hypothesises that Intention predicts Behaviour, while Attitude and Subjective Norm predict Intention (Fishbein and Ajzen, 1975). Ajzen and Fishbein (1980, p. 180) define Intention as the *"probability that a respondent will perform the stated action"*, while in Ajzen (1991, p.181), the author states that Behavioural Intention *"captures the motivational factors that influence behaviour"*. Attitude *"represents the person's general feeling of favourableness or unfavourableness for the behaviour in question"* (Ajzen and Fishbein, 1980, p. 285), while *"Subjective Norms are a person's own estimate of the social pressure to perform or not perform the intended behaviour"* (Ajzen and Fishbein, 1980, p. 6).

The TRA has been used to generalise explanations of individual behaviour. According to Agarwal (2000), behaviour is influenced by an individual's intentions to behave a certain way; individual variances influence Attitude, Intentions, and Behaviour only through the mediating construct of beliefs. The author further argues that a person's performance of certain behaviours is signalled by the establishment of a Behavioural Intention to participate in an activity. According to Davis (1989), TRA had been empirically tested and reported to have a strong predictive power in studies investigating the acceptance of information technology.

Albarq and Alsughayir (2013, p. 23) have reported that Attitude and Subjective Norm are positively correlated to IT use. The authors conclude that *"the TRA sufficiently addresses the impact of Attitude and Subjective Norm on the internet banking behaviour among Saudis"*.

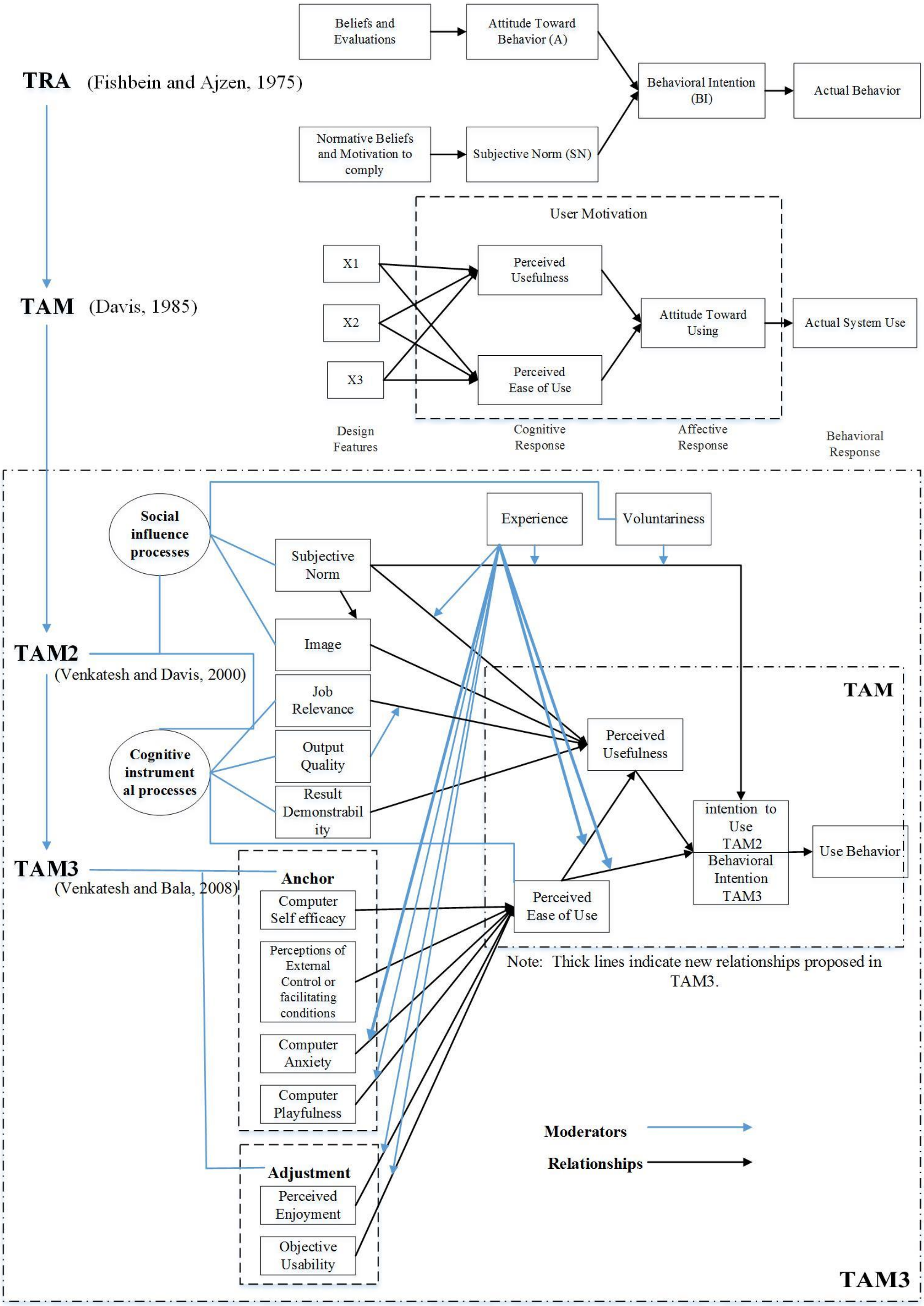
The extended TRA was used to study the behaviour of internet users and the effects of Attitude, Subjective Norm, and Past Behaviour on the intention to shop online among full-time employees in Thailand (Chuchinprakarn, 2005). The author identifies Attitude, Subjective Norm, and Past Behaviour to be the exogenous variables that influence Behavioural Intention in online shopping. The results show significant effects of trust and confidence in using a credit card, Subjective Norm, and Past Behaviour on the intention to shop online. Shih (2004) has studied internet banking in Taiwan using the TRA, the TPB and the decomposed TPB theories. The findings revealed that the intention to adopt internet banking can be explained by attitude in both the TRA and the TPB models, whereas there was no significant path relationship between the Subjective Norm and intention in either models. These findings prove that the TRA model provided a good fit to the author's data. Similarly, Ok and Shon (2006, p. 10) conducted a study of 300 personal banking customers in Korea, showing that the TRA can effectively predict Behavioural Intention to use internet banking, with Attitude and Subjective Norm explaining 73.9% of the variance in Behavioural Intention to use internet banking. The authors further noted that "*attitudinal belief structures, normative belief structures, and control belief structures are significant determinants of attitude, subjective norm and perceived behavioural control"*.

Another study focusing on green information technology (GIT) investigated the relationships among the TRA constructs and reported that Attitude towards behaviour and Subjective Norm had a strong positive effect on the Behavioural Intention of IT professionals in the adoption of GIT (Mishra et al. (2014). The authors further noted that Attitude towards behaviour was a more dominant factor than the Subjective Norm in determining intentions concerning green computing.

2.1.2.2. Technology Acceptance Model (TAM)

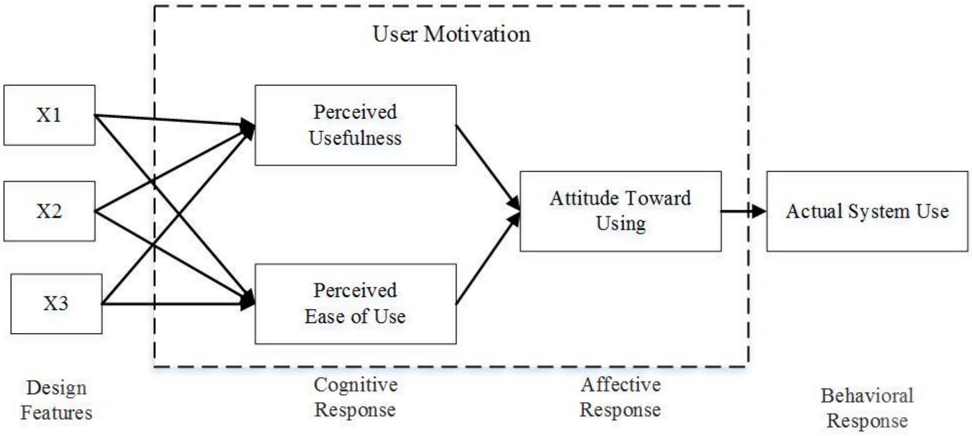
In his PhD thesis, Davis (1986) first proposed TAM, which has come to be one of the most widely used models allowing users to measure and predict the possibility of a system's being used or rejected. Thus, the development of TAM has improved the general understanding of new theories regarding the design and deployment of IS and evaluations of how system users embrace the new technology. Similarly, Davis (1986) states that TAM offers an opportunity for system designers to test the acceptance of planned systems prior to their implementation. It is worth to note that TAM is based on the TRA —a theoretical model of human behaviour—that was developed by Fishbein and Ajzen (1975) for the purpose of studying social psychology (Davis, 1986). In this literature review, the researcher will outline the development stages of TAM. Figure 2-2 (below) gives an overview of the evolution of TAM.

Figure 2-2: The Technology Acceptance Model Literature Review Outline



The TAM provides an explanation of the determinants of computer acceptance that explains user behaviour for various end-user computing technologies and user populations (Davis et al., 1989), by modelling user acceptance of information systems. Hence, the TRA is useful within TAM as it provides the basis that determines the links between the two core beliefs— Perceived Usefulness and Perceived Ease of Use—and the users' intentions, attitudes, and their actual adoption behaviour with the computers (Davis et al., 1989). In Figure 2-3, Davis (1986) outlines users' motivation in terms of three factors: Perceived Ease of Use, Perceived Usefulness, and Attitude towards the use of the system.

Figure 2-3: Technology Acceptance Model (Davis, 1986, p. 24)



Davis (1986, p.26) defines Perceived Usefulness as *"the degree to which an individual believes that using a particular system would enhance his or her job performance"*, while Perceived Ease of Use is defined as *"the degree to which an individual believes that using a particular system would be free of physical and mental effort"*. Fishbein and Ajzen (1975, p.353) define Use Behaviour as an individual's actual direct usage of the given system in the context of his or her job, while in Fishbein and Ajzen (1975, p.216), Attitude is defined as *"the degree of evaluative effect that an individual associates with using the target system in his or her job"*|.

The TAM is an extension of the TRA. It was developed by Davis in 1986 (as stated by Davis (1989); Davis et al. (1989); Yousafzai et al. (2007a)) and has been widely accepted among information systems researchers. Agarwal and Prasad (1999) have advocated for the inclusion of personality, demographic variables, situational experience, and training in TAM. The authors further note that TAM compares a system's success to the actual utilisation of the system, with Perceived Usefulness representing beliefs and Perceived Ease of Use representing attitude. Davis (1989) states that Perceived Usefulness captures the magnitude to which a potential adopter perceives innovation as offering value over alternative ways of accomplishing the same job, while Perceived Ease of Use is the degree to which a potential adopter perceives usage of the target technology as something that can be learnt effortlessly. Yousafzai et al. (2007a) have confirmed that Perceived Usefulness is influenced by Perceived Ease of Use.

It has been argued by Davis et al. (1989) that TAM can explain the causal relationships between users' internal beliefs, attitudes, intentions, and computer usage behaviour, and that the model is precisely predetermined to explain computer usage behaviour. The popularity of TAM is a result of its being parsimonious and IT-specific; it has a strong theoretical foundation with well-researched and validated psychometric scales, and has accumulated strong empirical support due to its overall explanatory power (Yousafzai et al., 2007a).

Attitude is also among the dependent variables included in TAM Fishbein and Ajzen (1975, p. 216) describe Attitude as an *"individual's positive or negative feelings about performing the target behaviour"*. Elsewhere, they contend that Attitude towards an object influences intentions, thus in turn influencing behaviour with respect to the object (its use) Ajzen and Fishbein (1980). The importance of Perceived Usefulness has been very much emphasised over Perceived Ease of Use as the key determinant of acceptance in TAM with the role of Perceived Ease of Use remaining debatable (Yousafzai et al., 2007a). Similarly, studies by Adams et al. (1992); Venkatesh and Davis (2000), have reported that Perceived Usefulness had a significant effect on system usage, but Perceived Ease of Use was relatively less significant.

However, Agarwal and Prasad (1997) have argued that Perceived Ease of Use has a direct and equal effect on technology adoption. Indeed, Karahanna and Limayem (2000) have even reported that Perceived Ease of Use had a stronger effect than Perceived Usefulness on the adoption of technology. Davis (1989) reported inauthentic relationships between Perceived Usefulness and initial usage, thus proposing that Perceived Ease of Use functions as an intervening variable between usage and Perceived Usefulness. Nevertheless, Dasgupta et al.

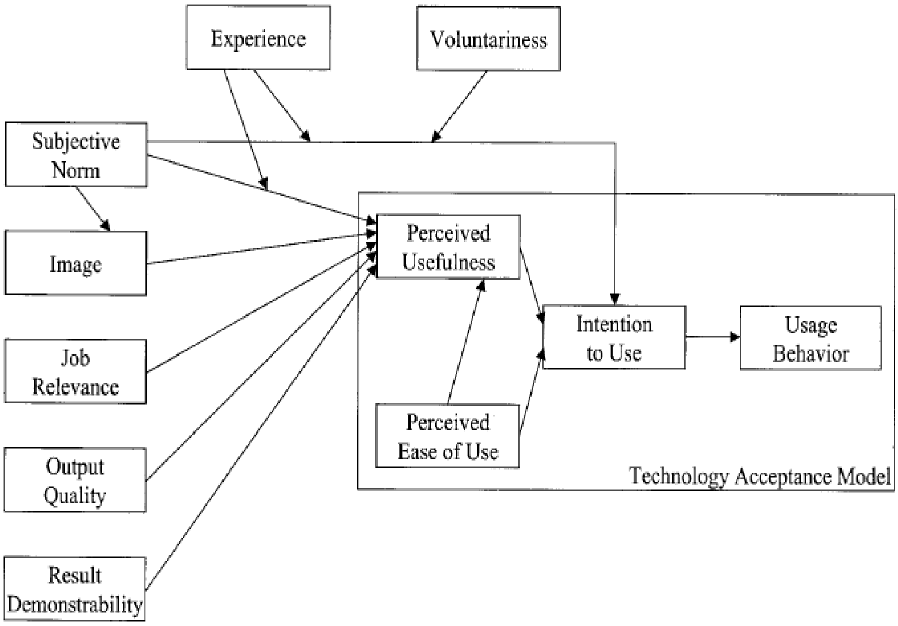
(2002) reported a negative effect of Perceived Usefulness on technology usage, while Chau (1996) study did not report any significant relationship between Perceived Ease of Use and intentions.

In their 1992 study, Davis et al. (1992)added Output Quality to TAM as an external variable, and since then, more than 70 external variables have been proposed for Perceived Usefulness and Perceived Ease of Use (Yousafzai et al., 2007a). Al-Gahtani (2008) tested the TAM in the KSA using 1190 end users from both public and private sectors and reported that the effect of Perceived Usefulness on Attitude towards using computers was moderated by age, such that it had the strongest effect for the older workers. However, age also moderated the influence of Perceived Usefulness on Behavioural Intention with younger workers demonstrating the strongest effect. The author's study did not report any significant moderation effect by gender on the influence of Perceived Usefulness on Attitude. However, the influence of Perceived Ease of Use on Attitude was significantly moderated by gender, whereby the effect was reported to be stronger among Saudi women. Educational level was also reported to moderate the influence of Perceived Ease of Use on Attitude, such that Saudi workers with a high education were reported to demonstrate the strongest effect. Hence, it is vital that information systems researchers study the moderation effects on the TAM in order to examine the overall value or impact of different form of technologies (Yousafzai et al., 2007a).

2.1.2.3. The Extension of the Technology Acceptance Model (TAM 2)

As proposed by Venkatesh and Davis (2000), Technology Acceptance Model 2 is based on the original TAM , with the inclusion of new theoretical constructs forming the basis of social influence processes: namely, Subjective Norm, Voluntariness, and Image. Similarly, cognitive instrumental processes were also added into TAM 2. They are as follows: Job Relevance, Output Quality, Results Demonstrability, and Perceived Ease of Use. In summary, all the supplementary constructs in TAM 2 are considered the general determinants of Perceived Usefulness. However, Experience and Voluntariness are supposed to moderate Intention to Use, while Experience also moderates Perceived Usefulness. The following section reviews these constructs.

Figure 2-4: The Extension of The Technology Acceptance Model (TAM 2) (Venkatesh and Davis, 2000, p. 188).



2.1.2.3.1. Social Influence Mechanisms

In TAM 2, Subjective Norm, Voluntariness, and Image are the social forces that can influence an individual when faced with a choice to accept or not to accept a new system (Venkatesh and Davis, 2000). To fully understand the social influence processes, certain social influence mechanisms—that is, compliance, identification and internalisation—must be defined further.

According to Venkatesh and Bala (2008, p.277), compliance *"represents a situation in which an individual performs behaviour to attain certain rewards or to avoid punishment*". Identification refers to *"an individual's belief that performing a behaviour will elevate his or her social status within a referent group since important referents believe the behaviour should be performed",* while internalisation is *"the incorporation of a referent's belief into one's own belief structure".*

2.1.2.3.1.1. Subjective Norm

Fishbein and Ajzen (1975, p.302) define Subjective Norm in terms of a person's perception of whether or not most people (who are important to him) think he should perform the behaviour in question. Similarly, Venkatesh and Davis

(2000) state that Subjective Norm has a direct effect on the intention to use a technological system, such that people might perform a behaviour even though the behaviour or its consequences do not appeal to them, especially if they believe that one or more important referents think they should. However, they must also have the required motivation to obey the referents.

There has been a mix-up in the findings from studies with regard to the direct influence of Subjective Norm on intention, with some studies concluding a significant effect while other studies show an insignificant influence. Venkatesh and Davis (2000) explain that, due to the insignificant influence of Subjective Norm on Intention, it was omitted from the original model. Compliance is the base mechanism through which Subjective Norm has a direct influence on intention. Similarly, Subjective Norm indirectly influences intentions via Perceived Usefulness, through two social process mechanisms: internalisation and identification (Venkatesh and Davis, 2000). Internalisation occurs when the user's beliefs are compatible with that of the influencing people, which makes the user want to use the system (such as when a co-worker starts using a specific system because it has been highly recommended to him by his or her co-worker).

Moore and Benbasat (1991, p. 195) define Voluntariness as *"the degree to which use of the innovation is perceived as being voluntary, or of free will".* Through the inclusion of Voluntariness as a moderator in TAM 2, a mandatory context became distinguishable in which Subjective Norm was reported to significantly influence intention to use. This was mainly due to the mechanism of compliance. Individuals are known to perform tasks required of them by a social factor with the power to punish or reward the performance or non-performance. However, Subjective Norm does not significantly influence intention to use in a voluntary context (Venkatesh and Davis, 2000). Thus, Venkatesh and Davis (2000) posited Voluntariness as a moderator in TAM 2 to differentiate between mandatory and voluntary usage contexts.

2.1.2.3.1.2. Image and Social Influence.

Moore and Benbasat (1991, p. 195) define Image as "*the degree to which use of an innovation is perceived to enhance one's image or status in one's social system*". Subjective Norm positively influences Image when important members of a person's social group believe that he or she should perform the behaviour in question. Thus, through performing the behaviour in question, a person's status is raised within their group through a social process mechanism known as identification (Venkatesh and Davis, 2000, p.189).

In TAM 2, the mechanism of identification is hypothesised to have a direct effect on the influence of Image on Perceived Usefulness and an indirect effect on the influence of Subjective Norm on Perceived Usefulness, via Image. Internalisation is another social mechanism process that has been theorised in TAM 2. It increases the perception of usefulness by users, which in turn increases the pursuit of new information about a system, no matter the context within which the system is used (that is, voluntary or mandatory) (Venkatesh and Davis, 2000).

2.1.2.3.1.3. Changes in Social Influence with Experience

Direct experience with a system enables users to gain more knowledge regarding its weaknesses and strengths, which might cause the influence of Subjective Norm on Perceived Usefulness to decrease over time, through the social process mechanism known as internalisation. Nevertheless, as Venkatesh explains, the direct effect of Subjective Norm on the intention to use a system decreases with time, even though the influence of Image on Perceived Usefulness does not decrease, due to identification.

2.1.2.3.2. Cognitive Instrumental Processes

Cognitive instrumental processes have a role in the perception of usefulness in that individuals form judgements concerning Perceived Usefulness in part cognitively, by comparing the work capabilities of a system and what they want to be accomplished by this system (Venkatesh and Davis, 2000). An individual forms perceptions relating to the working of a system when they compare the aims and the consequences of performing a specific task (Venkatesh and Bala, 2008).

2.1.2.3.2.1. Job Relevance

Venkatesh and Davis (2000, p.191) define Job Relevance as "*an individual's perception regarding the degree to which the target system is applicable to his or her job. In other words, job relevance is a function of the importance within one's job of the set of tasks the system is capable of supporting*". TAM 2 posits that Job Relevance is a cognitive judgement which has a direct effect on Perceived Usefulness.

2.1.2.3.2.2. Output Quality

Venkatesh and Bala (2008, p.277) define Output Quality as "*the degree to which an individual believes that the system performs his or her job tasks well*". In Venkatesh and Davis (2000), the authors state that people value the way the task is performed by the system, in addition to the criterion of Job Relevance. Thus, perceptions of Output Quality are also integrated into TAM 2.

2.1.2.3.2.3. Results Demonstrability

Venkatesh and Bala (2008, p.277) define Results Demonstrability as "*the degree to which an individual believes that the results of using a system are tangible, observable, and communicable*". According to Venkatesh and Davis (2000), this has a direct influence on Perceived Usefulness.

2.1.2.3.2.4. Perceived Ease of Use

In Technology Acceptance Model 2, Perceived Usefulness is influenced in a positive and direct way by both Perceived Ease of Use and Results Demonstrability (Venkatesh and Davis, 2000). Similarly, Venkatesh and Bala (2008) report that Job Relevance and Output Quality both moderate Perceived Usefulness, with Output Quality increasing the effect of Job Relevance on Perceived Usefulness.

2.1.2.3.2.5. Changes in Cognitive Instrumental Influences with Experience

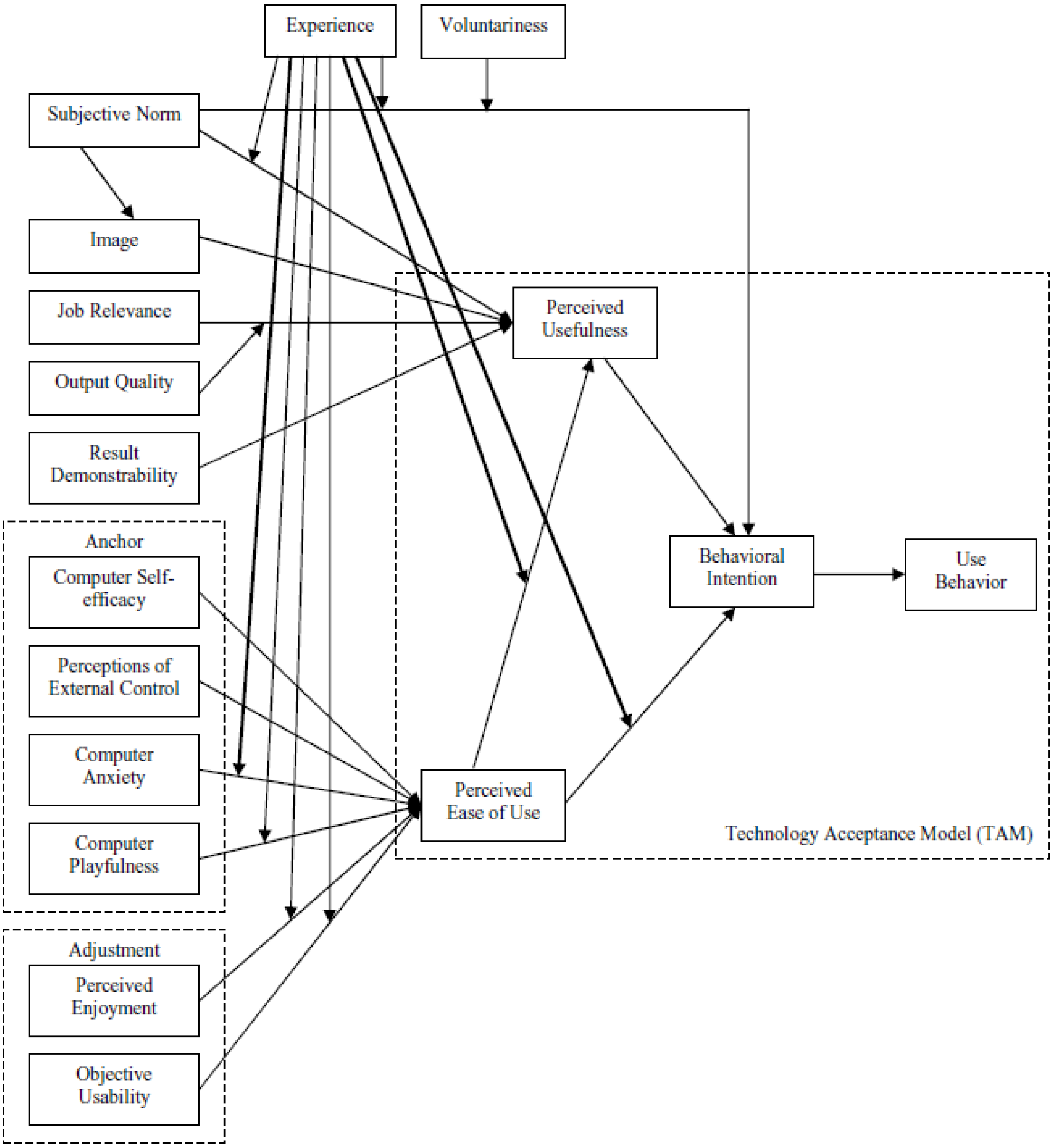
As has been stated by Venkatesh and Davis (2000), as time passes, individuals continue to depend on matching the goals of their job with the consequences of the system usage: that is, the relevance of the job functions as a foundation for their continued perceptions of usefulness. Similarly, as time passes, the extent to which the system performs an important role (Output Quality) remains a key determinant of Perceived Usefulness.

Venkatesh and Davis (2000) also state that, as time elapses, the influence of Perceived Ease of Use on Perceived Usefulness increases. Thus, mixed findings have shown both an increase and a decrease in the direct influence of Perceived Ease of Use on intention to use over time.

2.1.2.4. The Development of Technology Acceptance Model 3

An integrated TAM 3 was developed by Venkatesh and Bala (2008) (as shown in Figure 2-5) by combining TAM 2 (Venkatesh and Davis (2000) with the model of the determinants of Perceived Ease of Use (Venkatesh, 2000).

Figure 2-5: Technology Acceptance Model (TAM 3) (Venkatesh and Bala, 2008, p. 280).



2.1.2.4.1. The Model of Determinants of Perceived Ease of Use

Venkatesh (2000) developed the determinants of Perceived Ease of Use (as shown in Figure 2-6) after studying the concepts of anchoring and adjustments as they relate to the human decision-making process, as shown in Figure 2-7. Venkatesh argues that, as an individual uses a new system, they rely on their anchors to form their initial opinions concerning Perceived Ease of Use. Upon gaining experience, they adjust these initial opinions.

Figure 2-6: Theoretical Model of the Determinants of Perceived Ease of Use (Venkatesh, 2000, p. 346).

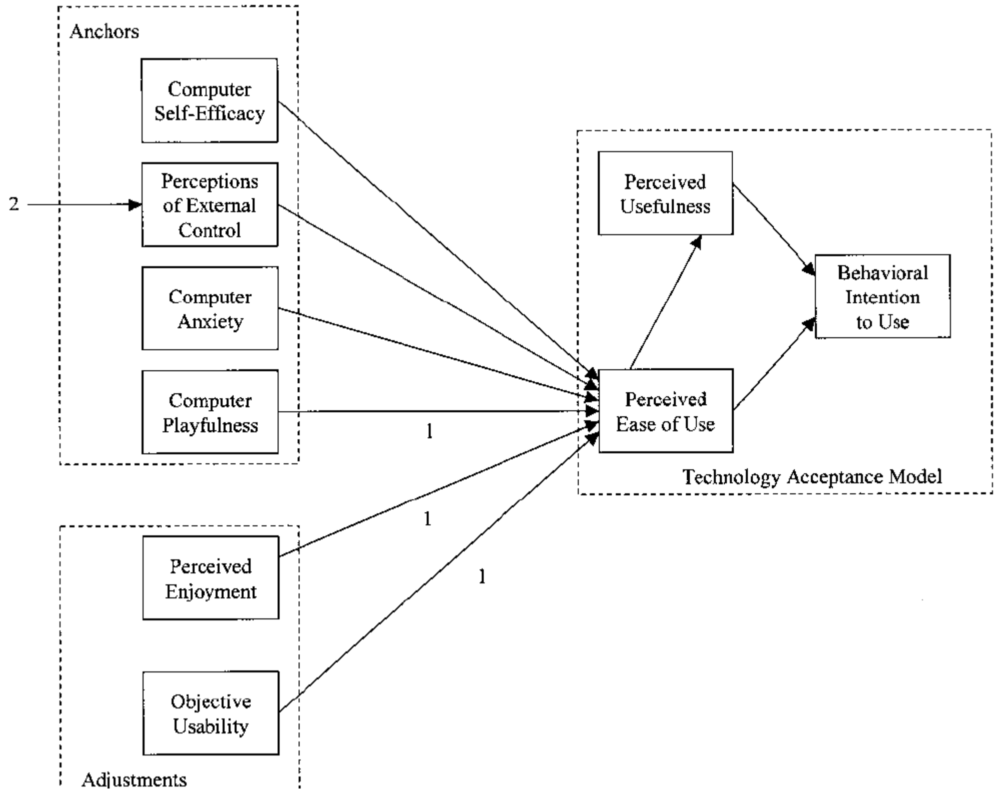
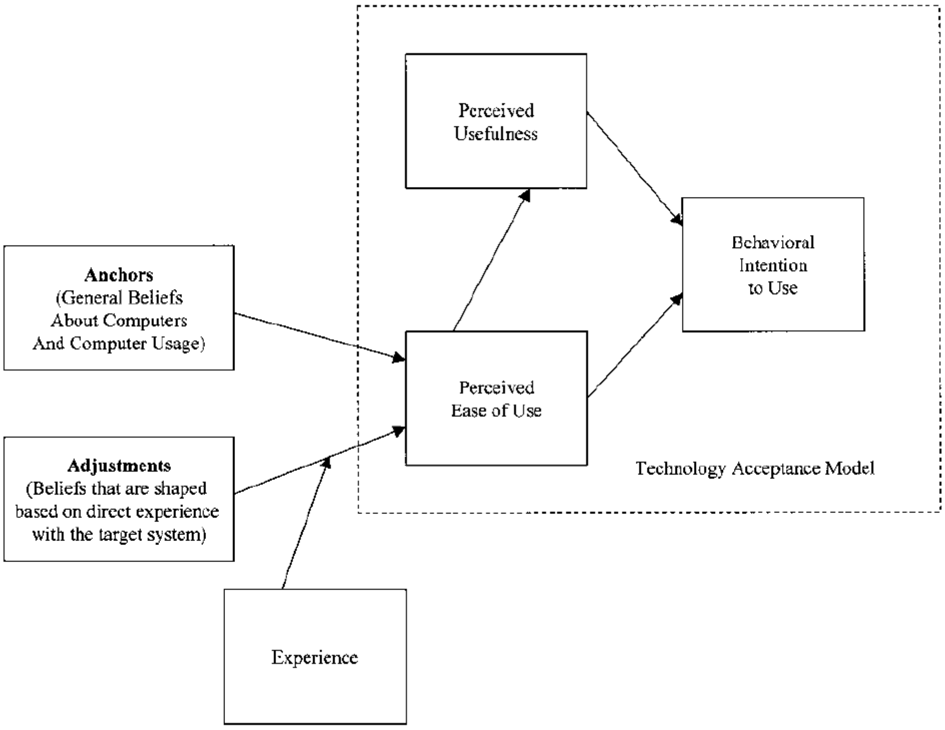


Figure 2-7: Theoretical Framework for the Determinants of Perceived Ease of Use (Venkatesh, 2000, p. 345) .



Anchors are individuals' general beliefs relating to computers and computer usage, while adjustments are individuals' beliefs that are formed based on direct experience with the target system.

Venkatesh and Bala (2008) proposed three anchors—namely, Computer Anxiety, Computer Self-Efficacy, and Computer Playfulness—that are categorised as individual differences. These are general beliefs associated with computers and computer use. Simultaneously, they proposed a fourth anchor—namely, Perceptions of External Control (or "facilitating conditions")—with Perceived Enjoyment and Objective Usability as the adjustments.

Behavioural decision theory explains that most people use the concept of anchoring and adjustment when faced with an important decision. That is to say, people depend on their knowledge of a given situation and use this knowledge as an anchor; they often struggle to disregard this anchored knowledge when making decisions. Therefore, as Venkatesh (2000) states, if an individual obtains new information regarding the situation—e.g., through interaction with target behaviour—they will generally adjust their anchored knowledge accordingly and henceforth continue to depend on their anchor as the key determinant in the decision-making process. The following section gives definitions of these determinants.

2.1.2.4.1.1. Anchors

2.1.2.4.1.1.1. Computer Self-Efficacy

Venkatesh and Bala (2008, p. 278) define Computer Self-Efficacy as *"individuals' control beliefs regarding his or her personal ability to use a system"*.

2.1.2.4.1.1.1. Computer Anxiety

Computer Anxiety was identified by Venkatesh (2000) as one of the main determinants of Perceived Ease of Use. He defines Computer Anxiety as *"the* *degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers"* (Venkatesh, 2000, p. 349).

2.1.2.4.1.1.2. Computer Playfulness

Computer Playfulness, as defined by Venkatesh (2000, p. 348), is the *"degree of cognitive spontaneity in microcomputer interactions"*. According to Venkatesh and Davis (2000), it is among the main determinants of Perceived Ease of Use.

2.1.2.4.1.1.3. Perceptions of External Control (or Facilitating Conditions)

Perceptions of External Control, which have also been described as "facilitating conditions", are one of the main determinants of Perceived Ease of Use, as identified (Venkatesh and Davis, 2000). The authors define Perceptions of External Control as *"individuals' control beliefs regarding the availability of organisational resources and support structure to facilitate the use of a system"* (Venkatesh and Davis (2000, p. 278).

2.1.2.4.1.2. Adjustments

2.1.2.4.1.2.1. Perceived Enjoyment

Perceived Enjoyment was proposed by Venkatesh and Davis (2000) as a way of assessing Perceived Ease of Use once individuals have gained some experience of using a new system. Venkatesh (2000, p. 351) has defined Perceived Enjoyment as the extent to which *"the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use"*.

2.1.2.4.1.2.2. Objective Usability

According to Venkatesh (2000, p. 350 & 351), in a TAM study, Objective Usability is defined as the *"comparison of systems based on the actual level of effort required to complete specific tasks"*.

2.1.2.4.2. New Moderating Roles of Experience Proposed in Technology Acceptance Model 3

TAM 3 outlines a complete nomological network for the determinants of adoption and use of information technology by individuals.

Thus, the model theorises three new relationships that are moderated by experience, although these relationships are yet to be tested empirically in the context of developing nations.

2.1.2.4.2.1. Perceived Ease of Use and Perceived Usefulness

Experience gained during the frequent use of a system is very important as it allows a user to decide on the ease of using a new system: that is, how easy or difficult it is to use a new system. Decisions concerning the easiness of using a system can strengthen the direct influence of Perceived Ease of Use on Perceived Usefulness, since users can seek to achieve advanced goals based on their experience.

2.1.2.4.2.2. Computer Anxiety and Perceived Ease of Use

As an individual gain more experience, the effect of Computer Anxiety on Perceived Ease of Use weakens.

2.1.2.4.2.3. Perceived Ease of Use and Behavioural Intention

As an individual gain more experience, the effect of Perceived Ease of Use on Behavioural Intention weakens.

As has been stated by Venkatesh and Bala (2008), in TAM 3, when individuals work on a new system and gain experience, they adjust the initial judgements (the anchors) that they had made regarding Perceived Ease of Use. These adjustments to TAM 3—that is, Perceived Enjoyment and Objective Usability—were proposed to help in determining Perceived Ease of Use once individuals have gained experience using a new system.

Venkatesh and Bala (2008) also state that, in TAM 3, the influence of Computer Self-Efficacy and the Perceptions of External Control remains strong even with an increase in experience, whereas the influence of Computer Playfulness and Computer Anxiety weakens.

2.1.2.4.3. Crossover Effects

Crossover effects are not allowed in TAM 3. If allowed, the general pattern of relationships in the model would not hold and thus Perceived Usefulness would not influence Perceived Ease of Use and vice versa.

2.1.2.5. Motivational Model (MM)

The self-determination theory was developed by Deci and Ryan in 1985, based on a motivational model (MM). Ryan and Deci (2000, p. 54) explain that *"motivation means to be moved to do something"*. The authors' study further states, *"A person who feels no impetus or inspiration to act is thus characterised as unmotivated, whereas someone who is energised or activated toward an end is considered motivated"*.

As Blais et al. (1990, p. 1022) have reported, MMs are based on self-determination theory (intrinsic-extrinsic conceptualisation). They argue that more self-determined types of motivational orientation trigger more adaptive behaviours and eventually more positive affective reactions. The authors further state that intrinsic motivation is related to positive consequences, while extrinsic motivation is related to more negative consequences. Cooper et al. (1995, p. 991), in a study using MM, state that *"negative emotions have strong motivational consequences, prompting cognitive and behavioural efforts aimed at managing, minimizing, or eliminating the source of the problem or the emotions themselves, whereas positive emotions do not generally elicit attributional searches or behavioural responding"*.

The self-determination theory primarily focuses on three innate needs: the needs for competence, relatedness, and autonomy (Deci et al. (1991, p. 329 & 330). The theory recognises four types of extrinsic motivation: *"external, introjected,* *identified, and integrated forms of regulation"*. External regulation *"refers to behaviours for which the locus of initiation is external to the person—the offer of a reward or the threat of a punishment"*. Introjected regulation *"refers to taking in but not accepting a regulation as one's own"*. Identified regulation *"occurs when the person has come to value the behaviour and has identified with and accepted the regulatory process"*. Integrated regulation *"are fully integrated with the individual's coherent sense of self such as individual's other values, needs, and identities"*. Ryan and Deci (2000, p. 55) argue that *"understanding the four types of extrinsic motivation, and what fosters each of them, is an important issue for educators who cannot always rely on intrinsic motivation to foster learning"*. In a study of self-determination and persistence in a real-life setting, conducted by Vallerand et al. (1997, p. 1169), the authors reported that self-determined motivation, or the lack of it, leads to vital real-life outcomes; thus, low levels of self-determined motivation lead to students' developing intentions like dropping out of high school.

A motivational model was used to study rural students' intentions to persevere or drop out of high school, using perceived self-determination, perceived competence, and school performance as the main predictors (Hardre and Reeve, 2003, p. 355). The model used accounted for 27% of the variance in dropout intentions. The authors reported that high school dropout was not only an achievement issue, but also a motivational issue. In summary, the study suggested that *"motivational resources significantly and uniquely predict achievement and persistence; achievements have relatively deeper roots in perceived competence; and the intention to persist has relatively deeper roots in perceived self-determination"*.

Findings resulting from the application of a motivational model of persistence to science education suggest that *"science teachers' support of students' autonomy positively influences students' self-perceptions of autonomy and competence"* (Lavigne et al., 2007, p. 351). The study's authors further noted that self-perceptions had a positive impact on students' self-determined motivation regarding science, influencing their intentions to pursue science education and, in the long run, work in a scientific field.

2.1.2.6. Theory of Planned Behaviour (TPB)

The TPB was developed by Ajzen in 1985, following the modification of the TRA through the inclusion of the third antecedent of intention, known as Perceived Behavioural Control (Ajzen and Fishbein, 1988, p. 3). The authors noted that *"Perceived Behavioural Control was the degree to which an individual feel that the performance or non-performance of the behaviour in question is under his or her volitional control*, *whereby Perceived* Behavioural Control *can influence behaviour directly or indirectly through Behavioural Intentions".* Not only does the TPB predict human behaviour, but it also explains it using the antecedents of Attitude, Subjective Norm, and Perceived Behavioural Control—antecedents which ultimately explain intentions and actions (Ajzen, 1991). Hence, the TPB hypothesises that *"Perceived Behavioural Control, together with Behavioural Intentions, can be used directly to predict behavioural achievement"* (Ajzen, 1991, p. 184). Ok and Shon (2006) have argued that the TPB was developed to predict non-volitional behaviour (where individuals lack complete control of their behaviour) across many settings.

It has been argued by Downs and Hausenblas (2005) that strong intentions and Perceived Behavioural Control increase the likelihood of a behaviour. Most intervention studies have applied the TPB constructs using Attitude, Subjective Norm, and Perceived Behavioural Control (Downs and Hausenblas, 2005). However, Ajzen (1991, p. 189) advocates that the development of interventions be based on normative beliefs *"which constitute the underlying determinants of Subjective Norm"*, control beliefs *"which provide the basis for Perceptions of Behavioural Control",* and behavioural beliefs *"which are assumed to influence Attitude toward the behaviour".*

As has been verified by Ok and Shon (2006, p. 5), *"Perceived Behavioural Control depends on control belief"* (that is, perception of the availability of skills, resources, and opportunities), *"weighted by perceived facilitation"* (that is, the individual's assessment of the importance of the resources required to achieve the intended outcomes). In their TPB findings, the authors report that attitudinal belief structures, normative belief structures, and control belief structures were all significant determinants of Attitude, Subjective Norm, and Perceived Behavioural Control. Similarly, they reported that Attitude and Perceived Behavioural Control were significant determinants of Behavioural Intention, although Attitude had a slightly stronger effect on Behavioural Intention than Perceived Behavioural Control. The author’s study did not find Subjective Norm to be significantly related to Behavioural Intention.

The TPB was used to predict intentions to use computer technology in the KSA using gender, age, and education as moderators (Baker et al., 2007, p. 368 & 369). The authors further reported a significant moderating effect of level of education with Perceived Behavioural Control on intentions to use technology, although there was no significant moderation effect when using gender and age. Similarly, they reported a strong influence of Subjective Norm and Perceived Behavioural Control on Behavioural Intention, as well as a strong association between Perceived Behavioural Control and Behavioural Intention, and lastly, a strong association between Subjective Norm and Behavioural Intention.

2.1.2.7. Combined Technology Acceptance Model and Theory of Planned Behaviour Model (C-TAM-TPB)

The C-TAM-TPB model is an augmented version of the TAM model that was developed by Taylor and Todd (1995a, p. 565) to study the role of prior experience of using information technology. The model was achieved through the inclusion of Subjective Norm and Perceived Behavioural Control in the original TAM thus making it a suitable assessment tool for investigating the determinants of IT usage (Taylor and Todd, 1995a). This made the model a suitable predictor for subsequent usage behaviour prior to users having hands-on experience with a system.

2.1.2.8. Model of PC Utilisation (MPCU)

The model of PC Utilisation was developed by Thompson et al. (1991), based on Triandis's 1977 theory of human behaviour. Triandis's model of interpersonal behaviour was based on the social factors, affects, and perceived consequences influencing Behavioural Intention, which thus ultimately influence behaviour.

2.1.2.9. Diffusion of Innovation Theory (DOI)

Rogers Everett (1995, p. 5) defines diffusion of innovation as *"the process by which an innovation is communicated through certain channels over time among the members of a social system".* DOI theory identifies five antecedents that are believed to affect the rate of diffusion of technology. These antecedents are relative advantage, complexity, compatibility, observability, and trialability (Al-Gahtani, 2003). In this study, the author concluded that relative advantage, compatibility, observability, and trialability were positively and significantly correlated with computer adoption and use, but complexity was not.

A mobile banking study in the KSA, conducted by Al-Jabri and Sohail (2012), suggested that relative advantage, compatibility, and observability had a significant effect on mobile banking, while complexity and trialability had an insignificant effect on the adoption of mobile banking.

2.1.2.10. Social Cognitive Theory (SCT)

Social cognitive theory (SCT) was first developed by Bandura (1977). According to Luszczynska and Schwarzer (2005, p. 11), SCT was *"based upon three types of expectancies: Situation-outcome, Action-outcome, and Perceived Self-Efficacy"*. The authors went on to define situation-outcome expectancies as *"beliefs about which consequences will occur without the interference of personal action"*, action-outcome expectancy as the *"belief that a given behaviour will or will not lead to a given outcome"*, and self-efficacy as the *"belief that a behaviour is or is not within an individual's control"*.

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

The UTAUT model was developed by Venkatesh et al. (2003) using eight previous models: namely, 1) the TRA , 2) TAM, 3) the MM, 4) the TPB , 5) a C-TAM-TPB, 6) the model of PC utilisation, 7) the DOI, and 8) SCT. Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions were the four main constructs in the UTAUT model for predicting user acceptance and usage behaviour. Gender, Age, Experience, and Voluntariness of use were the main moderators incorporated in the UTAUT model.

In a study using the UTAUT model to investigate the influence of culture on the acceptance and use of IT in the KSA by knowledge workers, Al-Gahtani et al. (2007) reported that Subjective Norm had a positive influence on Intention to use computers, although the influence diminishes as age and years of experience using computers increase. The authors also reported a positive influence of performance expectancy on Intention to use computers.

2.2. The Technology Acceptance Model in Relation to Other Approaches to Evaluating Technology Acceptance

In this part of the literature review, the major limitations of each of the previously investigated models are compared, so that the most appropriate theoretical model for this study can be chosen.

Although the TRA has been extensively used in predicting and explaining the behaviour determinants of computer usage, it has its own limitations. As Kurland (1995, p. 4) argues, *"The TRA is limited because it assumes that actions are totally under volitional control". This assumption fails to acknowledge that individuals' behaviour may be directed by systemic constraints"*. Kurland (1995) argues that the ability of the TRA to predict behaviour was a mix up. For example, Bagozzi et al. (1992) reported a non-significant relationship between affect (Attitude) and utilisation of personal computers (Behaviour), while Ajzen and Fishbein (1988) reported that the greatest limitation of the TRA model concerned individuals who felt or had little control over their behaviour and attitude.

Even though the TAM was an extension of TRA, and has been extensively applied by information systems researchers, it has its own limitations. Mathieson (1991) argues that focuses on Perceived Usefulness and Perceived Ease of Use but does not outline the formation of perceptions and how they can be developed to nurture users' acceptance and increase IT usage. Likewise, Chau and Hu (2001) study established some likely limits to explaining or predicting technology acceptance among individual telemedicine professionals using TAM. These include the fact that Perceived Ease of Use (of telemedicine) did not have any significant effects on Perceived Usefulness (of telemedicine) or Attitude (towards telemedicine), contrary to the findings of prior TAM studies. Similarly, Venkatesh and Davis (2000) also reported that one of the limitations of TAM was its ability to investigate Perceived Ease of Use for voluntary systems but not Perceived Ease of Use for mandatory systems.

The motivational model (MM) is based on self-determination theory via intrinsic-extrinsic conceptualisation. Some of its limitations have also been reported. For instance, Blais et al. (1990, p. 1029) report that the original MM produced little evidence that would support the argument that *"introjected regulation would also correspond to low levels of self-determined functioning"*. According to Hardre and Reeve (2003), the self-reported model is short of additional motivational constructs that would address motivation issues. Upon inclusion of additional latent variables in their study, the authors were able to explain an additional 10% of the variance in dropout intentions. This finding shows that the self-determined theory still needed additional motivational constructs to allow it to stand alone. Similarly, Lavigne et al. (2007, p. 363) have argued that the self-determined theory shows a partial mediational role for motivation in fields where abilities and talent are crucial; thus, there is need for more research that *"may lead to refinements in the self-determined theory"*.

The TPB is an extended modification of the TRA through the inclusion of Perceived Behavioural Control. However, the TPB has its own limitations, as argued by Ajzen (1991, p. 185): *"Perceived behavioural control is not realistic when a person has relatively little information about the behaviour, when requirements or available resources have changed"*. The TPB model does not take into consideration

> *personality and demographic variables; there has been much doubt with regard to the definition of perceived behavioural control; the assumption of perceived behavioural control to predict the actual behavioural control is not always the case; the model only works when some aspect of the behaviour is not under volitional control; the longer the time interval between behavioural intent and behaviour, the less likely the behaviour will occur; and lastly, it is based on the assumption that human beings are rational and make systematic decisions based on available information thus, unconscious motives are not considered*" (Ajzen and Fishbein, 1988, p. 5-6).

A lack of scale measurement correspondence has been reported among studies that use the TRA and the TPB. Hence, some researchers have advocated for a consensus on strong constructs that could be used as determinants of exercise intention and behaviour (Downs and Hausenblas, 2005).

The DOI also has its limits. MacVaugh and Schiavone (2010, p. 207) argue that the DOI model is more context-dependent than generally predictive, such that the model does not take into *"account the overlapping effects of the different contexts and domains in which almost all new technology operates"*.

The SCT model has its own limitations. As Nabi and Clark (2008, p. 425) argue, *"Contrary to SCT, even when behaviours are negatively portrayed, audiences may be motivated to perform them anyway"*. Call et al. (2016) state that SCT has proved controversial when applied to certain issues—for example, quitting smoking. The authors ask, *"Why are some self-efficacy beliefs apparently* *unrelated to behaviour?"*. In SCT, Bandura (1977) has argued, self-efficacy influences a person's choice of activities, effort, and persistence. However, Schunk (1991) disputes this statement by arguing that behaviour is a function of many variables, and thus, self-efficacy is not the only variable that has an influence on behaviour.

According to Moghavvemi et al. (2013), Behavioural Intention is weak in the UTAUT model, as its ability to predict behaviour is not wholly under a person's volitional control and it does not consider self-efficacy as a direct determinant of Intention. Similarly, Waehama et al. (2014) report that UTAUT suffered from limitations to the relationship between Intention and use of behaviour. The authors argue that, not only does the UTAUT model fail to consider Attitude as a direct determinant of Intention, but it also faces limitations in the relationship between Intention and Behaviour. Hamre (2008) has argued that the UTAUT model requires respondents to divulge their names in order to successfully complete the social network analysis. Thus, the respondents may not feel free to answer the questions accurately and truthfully, leading to biased responses. Similarly, the UTAUT model is sensitive to sample size, such that a small sample size reduces the power of significance tests and limits the statistical methods that can be used (Venkatesh and Davis, 2000).

2.3. A Review of Technology Acceptance Model Studies Conducted in the Middle Eastern Countries

Several TAM studies have been applied in various sectors in the context of the Middle East.

TAM was used to investigate acceptance and adoption of sophisticated technology among bank managers in the United Arab Emirates (Ghorab, 1997). A hierarchical regression analysis was used to investigate the perceptions towards the individual information systems' usefulness, ease of use, strengths, weaknesses, and the actual usage of the adopted technology. The study reported that perceived problems were unrelated to system usage and the level of technology adoption. Perceived Ease of Use was reported as not having any significant relationship to adoption decisions. However, the users' participation in adopting a system and their expectations of the systems were reported to be unrelated to the actual adoption of the system.

To predict the general information technology usage among knowledge workers in five developing Arab nations—namely, Jordan, Egypt, the KSA, Lebanon, and Sudan—Rose and Straub (1998) used an extension of Davis's DOI model with TAM. Perceived Ease of Use was reported to be strongly related to Perceived Usefulness, while both constructs were reported to have an impact on system use. Perceived Usefulness was reported to mediate the relationship between Perceived Ease of Use and system use, leading the authors to argue that TAM *"transferred successfully to the Arab world"*, such that *"knowledge on* Ease *of Use and Perceived Usefulness might aid in the development of implementation and training strategies in the Arab world"*(Rose and Straub, 1998, p. 45).

The was used to extend the course website acceptance model to assess students' acceptance of course websites, which are an effective learning tool at the United Arab Emirates University (Selim, 2003). Many of the participants in the study came from the Middle East. Course website usefulness, and Course website Ease of Use were used as the main constructs in the model. Course website usefulness was reported to significantly predict acceptance and usage of course websites. Course website Ease of Use was reported to be significant on course website usage and acceptance. Course website Ease of Use also had a significant effect on Course website Usefulness. In summary, course website Usefulness was reported to have a significant direct impact on the course website acceptance. Students' perception of its Usefulness was reported to be significantly and directly affected by its Ease of Use. Ease of Use was reported to be indirectly affected by course website acceptance, via Course website Usefulness as the mediator.

The TAM was used to conduct an exploratory analysis of culture in Jordan focusing on power distance, uncertainty avoidance, collectivism, and femininity, with age, gender, and education background and level used as the moderators (Akour et al., 2006). The results showed that Perceived Usefulness and Perceived Ease of Use had a significant positive impact on managers' intentions to use the internet, thus mediating the relationship between cultural dimensions and managers' intentions.

Al-Khateeb (2007) utilised perceptions of internet content (PIC) as an extension of TAM to predict students' internet usage in the United Arab Emirates (UAE), Chile, and America. Only Perceived Usefulness was reported to significantly predict internet usage in the UAE and Chile, while both Perceived Ease of Use and Perceived Usefulness predicted American students' internet usage significantly. PIC did not indicate any significant influence on students' usage of the internet in any of the three countries in the study. Educational background, family monthly income, internet cost, and internet availability were used in the study as moderators, but they failed to show any influence on students' usage of the internet in the three countries.

The applicability of extending in the context of the KSA by using three moderators—age, gender, and educational level—as well as extending TAM using Attitude and Intention, has also been tested (Al-Gahtani, 2008). The study reported that the influence of computer usefulness and ease of use on Attitude and Intention to use were moderated by age, and that the influence of ease of use on Attitude was only moderated by gender and educational level.

Anderson et al. (2008) have evaluated the use of TAM (adapted from Davis et al. (1989)) in a study in the KSA, by including Image, Results Demonstrability, and Subjective Norm (adapted from Venkatesh and Davis (2000)), and Computer Self-Efficacy, Computer Anxiety, and Perceived Enjoyment (adapted from Venkatesh (2000)). Image, Results Demonstrability, and Subjective Norm were reported to have a positive and significant influence on Perceived Usefulness. According to the authors, Subjective Norm had the most positive influence on Perceived Usefulness. The findings validated the use of Perceived Usefulness, Perceived Ease of Use, and Behavioural Intention on Saudi workers using desktop computers to perform related tasks. Al-Gahtani (2008) suggests that the antecedents of Perceived Usefulness and Perceived Ease of Use in their study could be replicated in developing countries and countries that do not follow Western cultural norms.

The technology adoption behaviour of knowledge workers using desktop computers in the KSA has been investigated by Baker et al. (2010) by applying the extended TAM 2 proposed by (Venkatesh and Davis, 2000, p. 40). The authors describe TAM 2 as measuring *"the impact of Subjective Norm,* V*oluntariness and Image, as they affect an individual's decision to adopt or reject a new system"* (Baker et al. (2010). Job Relevance, Output Quality, and Results Demonstrability were used as cognitive instrumental process variables. Subjective Norm was reported to have a positive direct influence on Perceived Usefulness and Image, as well as a positive direct influence on Behavioural Intention. Job Relevance and Results Demonstrability had a significant positive effect on Perceived Usefulness. Perceived Ease of Use was reported to have a positive direct effect on Perceived Usefulness. Output Quality had no significant effect on Perceived Usefulness. Experience and Voluntariness were used as moderators in the study, although they had no significant interaction. In their summary, Baker et al. (2010) state that, in order to understand the cultural effects that influence technology acceptance behaviour, future research should investigate additional cultural factors that account for technology acceptance.

TAM has been adapted and extended through the inclusion of new product attributes and social influences, in order to study the user acceptance of biometric authentication systems in e-Commerce in the KSA (Harby et al., 2010, p. 51). The effect of attributes towards biometric usage was reported to be significant and strong. Though the path coefficients for Perceived Usefulness and Social Influence on system use were significant, their effects were not as strong as indicated by their respective *Beta* estimates. Attitude towards usage was reported to be statistically significant and was related to the Perceived Usefulness and Perceived Ease of Use of the biometric authentication system. Similarly, Perceived Usefulness of the biometric authentication system that was also reported to be predicted by Perceived Ease of Use and the path coefficients were significant. In summary, the adopted TAM was reported to be a good predictor for the acceptance of the biometric authentication system, with the authors stating, *"It could be used as an indicator for the success of the acceptance of using biometric technologies in online banking log-in system*s *for both individuals and organizations".*

The TAM used in Anderson et al. (2011, p. 33) study was similar to the model used by Al-Gahtani (2008) to investigate the influence of antecedents of Perceived Usefulness and Perceived Ease of Use on the general use of computer systems by Saudi knowledge workers: a non-Western culture. Usage behaviour was excluded from the core TAM variables. Image, Results Demonstrability, and Subjective Norm were reported to have a positive and significant influence on Perceived Usefulness. The study concluded that *"Subjective Norm, Image, and Results Demonstrability as antecedents of Perceived Usefulness and Self-Efficacy"*—as well as *"Computer Anxiety and Perceived Enjoyment as antecedents of Perceived Ease of Use*"— "do *function in the specific context of general computer use by knowledge workers in the Kingdom of Saudi Arabia".*

2.4. The Evolution and Application of Technology Acceptance Models in the Middle East

2.4.1. The Application of Technology Acceptance Model Studies in the Middle East

The first published paper on the application of TAM in the Middle East can be traced back to 1997, from a study conducted in the UAE (Ghorab, 1997). Ghorab (1997) conducted the field study to investigate computerised bank systems and interviewed 47 bank managers. Self-reported use of computerised bank systems was the main dependent variable in the study.

A cross-sectional study was used by Rose and Straub (1998) to predict the general IT use by use of personal computers among 274 knowledge workers from Egypt, Jordan, the KSA, Sudan and Lebanon. This meant that, although the cultural background of the participants was multi-Arab, there was an influence of foreign participation and thus the study did not solely investigate the Saudis. The dependent variable investigated was self-reported use of personal computers. The main limitation of the study was that the authors did not describe the gender of their sample and hence could not state its effect on their study as a moderator.

The questionnaire method was used to conduct a laboratory study among 387 business students in Kuwait to investigate the Ease of Use and the Usefulness of transactional websites for online stores (Aladwani and Aladwani, 2002). The nationality of the participants in the study was not clear. Intention to purchase from an online bookstore was used as the main dependent variable. However, the authors did specify the gender of their participants: approximately 69% were female, and 31% were male. Nevertheless, they did not measure the impact of gender as a moderator in the study. The main limitation of the study was that the authors did not test Voluntariness, Experience and the system usage setting in their TAM.

A field study survey was conducted to investigate students' acceptance of course websites among 403 undergraduate students from nine different countries—

which the author does not specify—but mainly from the UAE in the Middle East (Selim, 2003). The author used the course website acceptance model (CWAM), which happens to be TAM applicable to course website technology. All the participants were non-Western. The main dependent variable investigated in the study was self-reported use of course-related websites. The gender of study participants was clearly described, with females and males comprising 69 and 31%, respectively. However, the effect of gender was not tested in the study. Similarly, Voluntariness and the system usage setting were not tested in the final model. Moreover, Experience was only measured descriptively and not tested.

Another field study survey to predict internet usage among college students in Chile and the UAE used an extended TAM. There were 169 participants from Chile and 194 from the UAE (Al-Khateeb, 2007). The main dependent variable used in the study was Intention to use the internet. Gender was clearly described for both samples: that is, 68% male and 32% female for the Chilean sample, and 49% male and 51% female for the UAE sample. Similarly, the effect of gender in the study was investigated. Although the study investigated Experience, it did not test Voluntariness or systems usage settings.

2.4.2. The Application of Technology Acceptance Model Studies in the Kingdom of Saudi Arabia

The UTAUT model and TAM were combined and used to investigate 306 online banking customers concerning the likeliness of the user's acceptance of biometric authentication systems in e-Commerce in the KSA (Harby et al., 2010). The study was laboratory-based, in combination with a survey method, and involved only Saudi participants; 44.1% (135) were female and 55.9% (171) were male. The study measured Use Behaviour as the main dependent variable. The effect of gender was investigated via the UTAUT model. Nevertheless, Voluntariness and Experience were not investigated. Although the system usage setting was tested, it was not clear enough whether or not it was voluntary. Using the same data, Harby et al. (2010) published a paper using only the TAM in which the only notable difference was that the effect of gender was not tested in their study.

2.4.3. The Application of Technology Acceptance Model 2 Studies in the Middle East

A field study survey was used to conduct an exploratory analysis of Perceived Ease of Use, Perceived Usefulness, and internet acceptance among 507 business managers and other senior management employees in banks in Jordan (Akour et al., 2006). However, the study was not clear about the nationality of the participants, although they were all non-Westerners. The main dependent variable in the study was self-reported use of the internet. Gender was clearly described in the study; of the participants, 80% (405) were male and 20% (102) were female. Nevertheless, the effects of gender and Voluntariness were not tested in the study. Similarly, Experience was measured but not analysed.

2.4.4. The Application of Technology Acceptance Model 2 Studies in the Kingdom of Saudi Arabia

A field study survey was conducted involving 1190 knowledge workers in the KSA, leading to publications by Al-Gahtani (2008); Anderson et al. (2008); Baker et al. (2010); Anderson et al. (2011). These four studies all focused on desktop computer applications as the main system of use. A close consideration of these four studies raises some serious critical questions. First, they have the same authors' names, with only a few slight changes between the corresponding authors. Second, all four papers report the same sample size (*N*=1190). Third, the studies by Al-Gahtani (2008); Baker et al. (2010) involved both Saudis and non-Saudis, whereas the studies by Anderson et al. (2008); Anderson et al. (2011) only involved Saudis. Fourth, all four studies use a field study survey. In terms of the models used, Al-Gahtani (2008) uses TAM , Baker et al. (2010) use TAM 2, and Anderson et al. (2008); Anderson et al. (2011) use TAM 2 with modified determinants of Ease of Use. Fifth, all four studies outline their demographic variables: Al-Gahtani (2008) includes 81.6% males (589), and 18.4% females (133) with a sample size of 722; Anderson et al. (2008) do not specify gender but include a sample size of 1088; Anderson et al. (2011) include a sample size of 1088 with 78% males (849) and 22% females (239); while Baker et al. (2010) feature a sample size of 1190, with 79.3% males and 20.7% females.

These results suggest that all four studies might have been published using the same dataset; thus, their findings are controversial and subject to criticism.

2.4.5. The Application of Technology Acceptance Model 3 Studies in the Middle East

Currently, only one study (by Al-Gahtani (2016)) has been published involving TAM 3 in either the KSA or the Middle East more broadly. However, it is worth highlighting a few of the main general points regarding TAM3, in the manner of the review that has been conducted of the original TAM and of TAM 2.

Venkatesh and Bala (2008) developed and proposed an integrated model (TAM 3) that focuses on potential pre- and post-implementation interventions, in order to facilitate the adoption and use of information technology among employees in an organisational context. The main dependent variable in the study was adoption and use of IT. Venkatesh and Bala (2008) describe experience as a vital moderating factor in the adoption of IT. Similarly, the authors note that a three-way interaction between Subjective Norm, Experience and Voluntariness had a significant effect on Behavioural Intention to use IT. The study was conducted for both voluntary and mandatory contexts. However, while system usage setting was investigated in the study, the authors did not describe the gender of the participants, nor did they test its effect in TAM 3.

2.5. Technology Acceptance Model 3 Studies Outside the Middle East

2.5.1. Introduction

The TAM has been extensively studied and extended. While TAM 3 has not been fully studied in the Middle East, the following section discusses the application of TAM 3 studies outside the Middle East. To better understand the criteria that were used in identifying the TAM 3 studies, a historical review is included, relating to the development of the full TAM 3.

The development of TAM 3 can be traced back to the development of the TRA model by Fishbein and Ajzen (1975), which had Attitude toward behaviour and Subjective Norm as the main determinants of Behavioural Intention, with Behavioural Intention believed to influence actual behaviour. Davis (1986) developed the first TAM by including Perceived Usefulness and Perceived Ease of Use as the main user motivation (cognitive response), and Attitude toward use as the affective response. TAM 2 was developed by Venkatesh and Davis (2000) through the inclusion of social influence processes: that is, Subjective Norm (a determinant of Perceived Usefulness and Intention to use), Image (a determinant of Perceived Usefulness), and Voluntariness (a moderator), as well as the cognitive instrumental processes—that is, Job Relevance, Output Quality, and Results Demonstrability (all determinants of Perceived Usefulness). TAM 3 was developed by Venkatesh and Bala (2008) through the inclusion of the determinants of Perceived Ease of Use in TAM 2. This inclusion involved the addition of anchors and adjustments to TAM 2. The anchors were as follows: Computer Self-Efficacy, Perceptions of External Control (Facilitating Conditions), Computer Anxiety, and Computer Playfulness. The adjustments included in TAM 3 were Perceived Enjoyment and Objective Usability, which were both moderated by Experience. Similarly, Computer Anxiety and Computer Playfulness were also moderated by Experience.

2.5.2. Technology Acceptance Model 3 Studies Search Criteria

Several criteria were used to select all the studies outside the Middle East that have used the full TAM 3, briefly described as follows: (1) Any TAM study that had the complete set of anchors and adjustments, as described above, was included. (2) TAM 3 was first proposed by Venkatesh and Bala (2008). Therefore, any study published prior to 2008 was not considered as utilising TAM 3. In their meta-analysis review on technology acceptance model studies, Yousafzai et al. (2007a); Yousafzai et al. (2007b) did not include the anchors and the adjustments outlined in TAM 3. (3) According to Venkatesh and Davis (2000), the two fundamental determinants of a user's Behavioural Intention to use a new technology are Perceived Ease of Use and Perceived Usefulness. Thus, in the search criteria, these two determinants formed the basis on which the technology acceptance model studies were selected.

2.5.3. Technology Acceptance Model 3 Studies Outside the Middle East

TAM 3 was developed by combining TAM 2 and the model of the determinants of Perceived Ease of Use, in order to investigate individuals' IT adoption and use. It posits that experience *"moderates the relationships between (i) Perceived Ease of Use and Perceived Usefulness; (ii) Computer Anxiety and Perceived Ease of Use; and (iii) Perceived Ease of Use and Behavioural Intention"* (Venkatesh and Bala, 2008, p. 281).

Using longitudinal studies, Venkatesh and Bala (2008) found Perceived Usefulness to be significantly predicted by Subjective Norm, Image, and Results Demonstrability. Similarly, Job Relevance and Output Quality were reported to have an interactive effect on Perceived Usefulness, with experience moderating the effects of Subjective Norm on Perceived Usefulness, and Subjective Norm having a significant effect on Image. Experience was reported to moderate the effect of Perceived Ease of Use on Perceived Usefulness, with the effect becoming stronger with increased experience. The anchors—namely, Computer Self-Efficacy, Perceptions of External Control, Computer Anxiety, and Computer Playfulness—were reported to be significant predictors of Perceived Ease of Use. The adjustments—namely Perceived Enjoyment and Objective Usability—were reported not to be significant at the initial stage of using IT. However, as experience increased, they were reported to be significant. Experience was also reported to moderate the effect of Computer Anxiety on Perceived Ease of Use, such that its effect became weaker with an increase in experience.

None of the determinants of Perceived Usefulness—that is, Subjective Norm, Image, Job Relevance, Output Quality, and Results Demonstrability—had a significant effect on Perceived Ease of Use. Nevertheless, Perceived Usefulness was reported to be the strongest predictor of Behavioural Intention, with experience moderating the effect of Perceived Ease of Use on Behavioural

Intention. A significant three-way interaction between Subjective Norm, Experience, and Voluntariness (Subjective Norm × Experience × Voluntariness) on Behavioural Intention was reported. Similarly, in a mandatory context, Venkatesh and Bala (2008) reported a stronger significant two-way interaction between Subjective Norm and Voluntariness (Subjective Norm × Voluntariness) on Behavioural Intention.

2.5.4. Technology Acceptance Model 3 Studies Without the Adjustments (Perceived Enjoyment and Objective Usability)

A study was conducted on the determinants of Behavioural Intention to use mobile banking among 900 Korean customers (Gu et al., 2009). The authors used TAM 3 but without the adjustments: that is, Perceived Enjoyment and Objective Usability. However, they included Trust as an extra construct in the model. The proposed model strongly supported 72.2% of the variance in Behavioural Intention to use mobile banking. Nevertheless, Use Behaviour was not included in the model. Similarly, Self-Efficacy—an antecedent of Perceived Ease of Use—was reported to both directly and indirectly influence Behavioural Intention via Perceived Usefulness in the case of mobile banking. Structural Assurances was also reported to be a strong antecedent of Trust, which increased Behavioural Intention to use mobile banking.

A study was conducted based on a cross-cultural analysis of the use and perceptions of web-based learning systems among university students from Spain and Chile (Arenas-Gaitan et al. (2011). The model only included Perceptions of External Control as an antecedent of Perceived Ease of Use and lacked Perceived Enjoyment and Objective Usability as adjustments. Similarly, Job Relevance and Results Demonstrability were the only two antecedents of Perceived Usefulness included in the model. Perceived Ease of Use was reported as having the strongest influence on the Behavioural Intention to use web-based learning systems, followed by Perceived Usefulness. Similarly, Perceived Ease of Use had a significant influence on Perceived Usefulness. However, Behavioural Intention had a variance of 22% while Use Behaviour only had a variance of 3%. Perceptions of External Control, Results Demonstrability, and Job Relevance were also reported to have a significant influence.

The use of a social network site was evaluated among Generation Y (youths) jobseekers in Netherlands (*N*=229) (Klerks (2011). The study reported that Perceived Ease of Use was a relatively less significant determinant in predicting Behavioural Intention to use social network sites. The research model used in this study did not include the adjustments for Perceived Ease of Use. Similarly, the study focused on Intention to use instead of Behavioural Intention. Computer Self-Efficacy was reported to have a positive effect on the Perceived Ease of Use of social network sites for the jobseekers. The results for the main predictors in the study were as follows: Subjective Norm explained 8.6% of the variance, Image 31.4%, and Results Demonstrability 8.3%. Subjective Norm had no significant effect on Behavioural Intention. Similarly, Perceived Enjoyment, Perceptions of External Control, Computer Playfulness, and Computer Anxiety were all reported to be significant predictors of Perceived Ease of Use.

A theoretical model was developed by Huang et al. (2012), based on the TAM 3. The authors used it to investigate the factors influencing the adoption of data-mining tools among 209 participants from Taiwan, along with the information management and business administration alumni of a university. The model explained 58% of the variance in Behavioural Intention to use the data-mining tools. Perceived Usefulness was reported to contribute the highest variance (74%) towards Behavioural Intention, while Perceived Ease of Use contributed 54%. However, the model lacked the adjustments for Perceived Ease of Use.

Another TAM 3-based model was proposed that included Personal Innovativeness and Perceived Interaction as additional variables, in order to investigate Behavioural Intention, Use Behaviour, and the acceptance of electronic learning systems (Agudo-Peregrina et al., 2014). The two samples for the study were students from public universities in Madrid, Spain (*N*=66), and individuals who had qualified for courses from the lifelong learning programme at the Polytechnic University of Madrid (*N*=81). Similarly, all of the antecedents of TAM 3 were missing from the model, including the adjustments for Perceived Ease of Use. The model explained 53% of the variance in Behavioural Intention, and 68% of the variance in self-reported frequency of Use Behaviour among the higher education students. Similarly, among the lifelong-learning students, the model explained 44% of the variance in Behavioural Intention and 4% in self-reported frequency of Use Behaviour. Perceived Usefulness had a stronger influence on Behavioural Intention when compared to Perceived Ease of Use. Multigroup analysis showed that there were significant differences between the higher education students and the lifelong learning individuals, specifically in the following effects; Computer Anxiety on Perceived Ease of Use, Perceived Playfulness on Perceived Ease of Use, Personal Innovativeness in the Domain of IT (PIIT) on Perceived Ease of Use, facilitating conditions on self-reported frequency of Use Behaviour, and finally, habit on self-reported frequency of Use Behaviour. The study concluded that Perceived Usefulness and Subjective Norm were the most relevant predictors of Behavioural Intention to use e-Learning systems in Spain.

Wook et al. (2014) proposed using an integrated technology readiness index (TRI), along with TAM 3, to investigate the end-user determinants of data-mining technology adoption among students in institutions of higher learning in Malaysia. The study proposed the inclusion of Computer Self-Efficacy and Perceptions of External Control as having a direct effect on the adoption of data-mining technology. Similarly, the study adopted Experience as a direct determinant of Perceived Ease of Use.

The general extended technology acceptance model (GETAMEL) was used on 242 UK undergraduate students to investigate the influence of Perceived Ease of Use and Perceived Usefulness on the use of an e-portfolio (Abdullah and Ward, 2016). Both Perceived Ease of Use and Perceived Usefulness were measured using five antecedents: Experience, Subjective Norm, Enjoyment, Computer Anxiety, and Self-Efficacy. Experience was reported to be the best predictor of Perceived Ease of Use, followed by Enjoyment, Self-Efficacy, and Subjective Norm. Similarly, Perceived Ease of Use was the best predictor of Perceived Usefulness, followed by Enjoyment. Perceived Ease of Use and Perceived Usefulness both predicted Behavioural Intention to use the e-portfolio.

2.5.5. Technology Acceptance Model 3 Studies with Intention to Use (Technology Acceptance Model 2) and Attitude.

A study was conducted among university students (*N*=628) from Seoul, Korea, to investigate their Behavioural Intention to use an e-Learning system (Park, 2009). The model used in the study included e-Learning Self-Efficacy, Subjective Norm, System Accessibility, Perceived Ease of Use, Attitude and Behavioural Intention to use e-Learning. Perceived Usefulness was only assessed using two antecedents—namely, Subjective Norm and e-Learning Self-Efficacy—while Perceived Ease of Use was measured using the System Accessibility organisation factor as the only antecedent. e-Learning Self-Efficacy was reported to have the strongest influence on Behavioural Intention. Perceived Ease of Use and Perceived Usefulness were both reported to influence users' Attitude, with Perceived Usefulness having a stronger influence compared to Perceived Ease of Use. Similarly, Subjective Norm was reported to be the main determinant of Perceived Usefulness, while e-Learning Self-Efficacy was reported to have the strongest influence on Perceived Ease of Use.

The role of information quality on online product review among *N*=716 Chinese internet users was investigated by Yu (2009), using structural equation modelling. Perceived Enjoyment, Usefulness, Intention, and Attitude were among the TAM constructs. The author reported that, among TAM constructs, the effects were as follows: Perceived Enjoyment had a 0.04 effect on Perceived Usefulness; Perceived Enjoyment had a 0.28 effect on Attitude towards the online product site; and Perceived Enjoyment had a 0.27 effect on Intention to use the online product site.

In their study, Hong et al. (2011) investigated factors affecting usage of the Taiwan digital archive system by *N*=376 registered teachers, using the TAM . SEM was used to investigate the causal relationships hypothesised. Interface design and playfulness concerns were the only antecedents that were investigated in the study, with both having a direct effect on Perceived Usefulness and Perceived Ease of Use, which were in turn proposed as influencing Attitude toward the digital archive websites. Perceived playfulness had no significant influence on Behavioural Intention to use the digital archive system. Perceived Usefulness had the strongest influence on Attitude while Perceived Ease of Use had the least influence. Similarly, Perceived Ease of Use had a significant influence on Perceived Usefulness. Playfulness was also reported to have a significant influence on Perceived Usefulness, although it had no significant influence on Intention. However, Perceived Usefulness had a direct significant influence on Intention.

Social influence was the only antecedent of Perceived Usefulness, while facilitating conditions and anxiety were chosen as antecedents of Perceived Ease of Use. Both Perceived Usefulness and Perceived Ease of Use were used as the main determinants of Attitude towards use, while Attitude towards use was proposed to be the determinant of Behavioural Intention to use the web-based learning system. Perceived Usefulness was reported to have the strongest influence on Attitude towards use while Perceived Ease of Use had the least. However, Perceived Ease of Use had a significant influence on Perceived Usefulness. Facilitating conditions was reported to be the antecedent with the strongest influence on Perceived Ease of Use. Similarly, Perceived Usefulness had a direct significant influence on Behavioural Intention to use the web-based learning system, where Behavioural Intention explained a variance of 94%.

In another study, Šumak et al. (2011) used structural equation modelling (SEM) to investigate the factors that have an impact on perceptions regarding the use and acceptance of an open-source e-Learning system (Moodle) among 235 electrical and computer science students in Slovenia. Behavioural Intention and Attitude were reported to be the main predictors of use of Moodle. However, Perceived Usefulness was reported to have the strongest influence on Attitude towards using Moodle. Attitude towards use of Moodle had no significant influence on Behavioural Intention. However, Attitude towards use was reported to have a significant influence on use of Moodle. Similarly, Perceived Ease of Use was reported to have a significant influence on Perceived Usefulness, which was also reported to have a direct significant influence on Behavioural Intention.

A meta-analysis was conducted on *N*=58 studies from different countries. The study proposed a mobile commerce adoption model and tested the moderating effect of culture (the Western and the Eastern cultures) using SEM (Zhang et al. (2012). Culture was reported to have a significant moderating effect on the relationship between Behavioural Intention and Use Behaviour, on the influence of Perceived Ease of Use on Behavioural Intention, of Perceived Usefulness on Attitude, of Perceived Ease of Use on Perceived Usefulness, and of Subjective Norm on Perceived Usefulness.

Padilla-Melendez et al. (2013) have investigated the effect of Perceived Playfulness on the use of Moodle among N=484 University students in Spain by studying the gender differences in the context of a blended learning setting. Computer Playfulness was the only antecedent used in the study. Perceived Usefulness and Perceived Ease of Use were posited as the determinants of Attitude in the model. Perceived Playfulness was reported to have a stronger influence on Perceived Ease of Use among males compared to females. Perceived Ease of Use had a stronger influence on Perceived Usefulness among males compared to females. Similarly, Perceived Usefulness had a stronger influence on Attitude among males compared to females. Attitude also explained the highest variance in males than in females, and the same applies to the variance for Intention to Use.

The TAM and UTAUT model were used to investigate the influence of gerontechnology acceptance among N=1012 inhabitants of Hong Kong, Chinese who were over 55 years old (Chen and Chan, 2014). The effects of Perceived Usefulness, Perceived Ease of Use, and Attitude towards using gerontechnology on usage behaviour were non-significant. However, Self-Efficacy, Anxiety, and facilitating conditions were reported to predict gerontechnology usage behaviour.

The antecedents of Attitude and Intention to use mobile devices in private clubs have been studied, based on N=737 club members in the United States of America (Morosan and DeFranco, 2014). The proposed model posited a relationship between Perceived Ease of Use and Perceived Usefulness, and an effect of Subjective Norm and facilitating conditions on Attitude. Similarly, Attitude was posited as the determinant of Intention. Perceived Ease of Use was reported to be a significant antecedent of Perceived Usefulness. Perceived Usefulness was the strongest predictor of Attitude. Subjective Norm had a significant influence on Attitude, while facilitating conditions was reported to have a weak relationship with Attitude. Attitude was reported to be the strongest predictor of Intention. The authors concluded that Perceived Usefulness and Subjective Norm had an impact on the development of Attitude, which in turn influenced club members' intentions to use mobile devices in their clubs.

Using an extension of the UTAUT , Teo and Zhou (2014) investigated factors that might influence the Intention to use technology among N=314 higher education students from a teacher training institute in Singapore. SEM was the main analytical tool. Self-Efficacy, Subjective Norm and facilitating conditions were used as the antecedents in the study. Self-Efficacy was used as an antecedent of Perceived Usefulness and Perceived Ease of Use, while Subjective Norm was also used as an antecedent of Perceived Usefulness and Perceived Ease of Use. However, facilitating conditions was used as an antecedent of Perceived Ease of Use and Attitude towards using technology. Perceived Usefulness, Perceived Ease of Use and facilitating conditions were all reported as significant predictors of Attitude towards technology. Attitude towards technology was reported as a significant determinant of Intention to use technology. Similarly, Perceived Usefulness had a moderate significant influence on Intention to use technology. Perceived Usefulness was also reported to have a significant influence on Attitude towards technology. Perceived Ease of Use had a strong influence on Perceived Usefulness. The antecedent Self-Efficacy was reported to have a significant influence on Perceived Usefulness. Subjective Norm was reported to have a significant influence on both Perceived Usefulness and Perceived Ease of Use, with the effect being stronger on Perceived Ease of Use. Similarly, facilitating conditions was reported to have a significant influence on Attitude towards technology and Perceived Ease of Use.

A study on the acceptance of cloud computing was conducted among doctors and nurses in Malaysia, using the multiple linear regression technique (Abdullah and Seng, 2015). Perceived Usefulness explained a variance of 51.3% in Behavioural Intention, while Attitude explained a variance of 48.2% in

Behavioural Intention. Similarly, Perceived Ease of Use explained 43.3% of the variance in Behavioural Intention. Perceived Usefulness, Attitude toward use, and Perceived Ease of Use were reported to significantly influence the doctors' (*N*=16) and nurses' (*N*=136) Intention to use cloud computing solutions.

Using an extension of TAM , Fathema et al. (2015) investigated the factors that might affect faculty members (*N*=560) in relation to the use of learning management systems (LMSs), with the faculty members and graduate teaching assistants coming from two universities in the United States of America. Attitude toward using LMSs was reported as a significant determinant of Behavioural Intention. Behavioural Intention was reported to predict the actual use of LMSs. The influence of Perceived Ease of Use on Perceived Usefulness and Perceived Ease of Use on Attitude towards using LMSs—as well as Perceived Usefulness on Attitude, Perceived Usefulness on Behavioural Intention, and facilitating conditions on Perceived Ease of Use—were all reported as significant hypothesised relationships.

The role played by facilitating conditions and Computer Self-Efficacy in the Intention to use computer simulations was investigated among sophomore students from the Department of Information Management at the National University of Tainan in Taiwan (Liu and Huang, 2015). However, the study had limitations in that, due to its small sample size (*N*=20), SEM could not be performed; instead, the partial least square (PLS) method was used to run the analysis. Behavioural Intention was not significantly predicted by facilitating conditions, but it was a significant predictor of Perceived Usefulness. Facilitating conditions was also reported to have a negative influence on Perceived Ease of Use, although it had an indirect positive effect on Behavioural Intention. Perceived Usefulness had a positive influence on Attitude towards computer simulations. Computer Self-Efficacy significantly predicted Behavioural Intention, where Computer Self-Efficacy was a significant determinant of Perceived Ease of Use and Perceived Usefulness. However, Perceived Usefulness had the strongest significant influence on Behavioural Intention; similarly, it was reported to be a strong determinant of usage Intention.

In their study, Son et al. (2015) investigated the factors that might facilitate architects' adoption of building information modelling among *N*=162 architects in Korea, using an extended TAM. Subjective Norm was among the antecedents of Perceived Usefulness, while facilitating conditions and Computer Self-Efficacy were the antecedents of Perceived Ease of Use. Perceived Usefulness and Perceived Ease of Use were reported to have a significant positive effect on Behavioural Intention. Subjective Norm was reported to have a significant effect on Perceived Usefulness. Facilitating conditions had no significant influence on Perceived Ease of Use. However, Computer Self-Efficacy was reported to have a significant positive influence on Perceived Ease of Use.

A quantitative meta-analysis was performed on *N*=107 papers that had used the TAM in the context of the adoption of e-Learning systems (Abdullah and Ward, 2016). The authors reported that the most commonly used antecedents in TAM studies of Perceived Ease of Use and Perceived Usefulness were Self-Efficacy, Subjective Norm, Enjoyment, Computer Anxiety, and Experience. The result showed that Self-Efficacy, Enjoyment, experience, Computer Anxiety, and Subjective Norm were the best predictors of students' Perceived Ease of Use of e-Learning systems, in the stated order. Similarly, Enjoyment, Subjective Norm, Self-Efficacy, and experience were reported to be the best predictors of students' Perceived Usefulness, in the stated order.

The purpose of this study is to identify and address the research gap in the limited number of studies that have been conducted regarding technology acceptance, using the TAM as a predictive instrument for acceptance and usage in the Middle East, especially in the KSA. To date, 14 TAM studies have been conducted in the Middle East context (Ghorab, 1997; Rose and Straub, 1998; Aladwani and Aladwani, 2002; Selim, 2003; Akour et al., 2006; Al-Khateeb, 2007; Al-Gahtani, 2008; Anderson et al., 2008; Baker et al., 2010; Harby et al., 2010; Anderson et al., 2011; Al-Adwan et al., 2013; Alharbi and Drew, 2014; Al-Gahtani, 2016). The majority of these studies use the TAM, TAM 2, and/or part of the model extension that uses the determinants of Perceived Ease of Use. Only Al-Gahtani (2016) study was conducted in the KSA and uses TAM 3. These studies have not fully investigated all the antecedents and moderators of TAM 3. As a result, this study aims to cover these gaps while investigating further the influence of Saudi hierarchical culture on the mandatory and voluntary IS usage contexts.

2.6. The Role of Social Influence in Information Systems

A study of managers in the KSA, conducted by Ali and Al-Shakis (1985), reported that managerial value systems differ according to sector of enterprise, region of childhood, social class background, income, educational level, management level, and size of the company, thus confirming that value differences do exist within certain groups across demographic variables. Using the TPB to investigate the impact of attitudes, beliefs, and Subjective Norm on technology adoption, Baker et al. (2007) reported that gender and age were non-significant moderators, for education level was the only significant moderator education level within the Saudi context. In a study on the attitude towards broadband in the KSA, conducted by Kolsaker et al. (2007), usefulness, service quality, age, usage, type of connection and type of accommodation were all reported as significant. Likewise, the authors reported that socio-cultural factors did not negatively affect the adoption of broadband in the KSA.

In a study on computer acceptance, done by Al-Gahtani (2004), education, organisation level, and culture were reported to have significant positive effects on computer usage, while gender and nationality (Saudi and non-Saudi) were found to have significant negative effects on computer usage. In addition, the study advocated for the incorporation of more women in future studies in the KSA to better reflect the demographic effects and the role played by gender in the acceptance of IT. According to Straub et al. (2001), culture offers people a sense of order in their lives, and thus cultural beliefs and the values of different cultures have differing effects on how people construct meaning in relation to technology. Hofstede (1984) indices report that Arabs have a greater sense of cultural collectivism than North Americans; that is, Arabs are more likely to give responses to interview questions which reflect their group leader's opinions instead of their own. Furthermore, the author reports that some Arab countries, such as Jordan, exhibit high power distance, high uncertainty avoidance, low individualism, and low masculinity, such that Jordan does not present ideal circumstances for the promotion of technology acceptance and computer usage.

The KSA is a conservative country, where Islamic teachings and Arabian cultural values take centre stage. The country follows distinct tribal demarcations and adheres strictly to Islam, although it is significantly influenced by its exposure to Western countries (Dadfar, 1990; Dadfar et al., 2003). According to Baker et al. (2007), the prevailing Islamic culture within the KSA posits that women are not supposed to work outside of the home; as such, gender integration in the workplace is difficult to achieve because women are not allowed to be out in public unless accompanied by a male relative.

Likewise, Baker et al. (2007) suggest that the KSA represents a much more conservative culture than other Muslim cultures, which have less formal and traditional practices. Culture was suggested by Png et al. (2001) to have a significant role in the acceptance and use of information technology. In a study done by Baker et al. (2010) using TAM 2, the model accounted for 40.3% of the variance in Behavioural Intention among the Saudi users. The Noor system study used TAM 3 and reported the variance in Behavioural Intention as 43% for the teachers, 29% for the parents, and 40% for the students. Thus, it was concluded that TAM 3 was a better predictor of Behavioural Intention among the Noor users.

The cultural influence model for IT transfer was developed by Straub et al. (2001). It has been suggested that Arab cultural beliefs are strong predictors of resistance to IT transfer. In his study using the original TAM model, Al-Gahtani (2008) investigated gender, age, and educational level as moderators within the context of Saudi Arabian culture. Although this study included both Saudis and non-Saudis, the non-Saudi were excluded on the grounds that the remaining sample would effectively represent the influence of non-Western culture. This process can be criticised because the non-Saudis could have been Arabs from other Middle Eastern countries and, by comparing the two groups in depth, more generalised findings could have been obtained.

In a study of 56 Arabian organisations, Hu et al. (2014) reported that cultural considerations can influence an individual's behaviour, including their technology acceptance. The study further reported that Arabian perceptions, attitudes, and intentions are likely influenced by important others within their family or organisation, which could in turn demonstrate the intention to comply with group norms, societal benefits, or religious values.

According to Straub et al. (2001), the complex societal beliefs and values of Arabs provide a rich setting that can be used to examine the influence of culture on technology acceptance. On top of this, the authors argue that the Arabian culture has the most complex cultural and social systems in the world. Likewise, Sidani and Thornberry (2010) argue that Arabian culture values group relationships which exhibit a close-knit social structure that builds and nature conformance pressures on its members. It has been argued that the inclusion of culture-oriented factors is very important as they can directly influence users' adoption behaviour (Baker et al., 2010; Datta, 2011). Culture can exert an effect on the predictive capacity of the TAM (Straub et al., 1997), in addition to the original TAM holding ground across settings, culture, countries, time, and robust theories (Campbell, 1979). Thus, it was deemed very important to include the element of culture in the current study by investigating the role that socio-demographics might play in the acceptance of the Noor system.

2.7. The Effect of Retaining or Discarding Use Behaviour as the Main Dependent Variable in Technology Acceptance Model 3 Under a Self-Reported System Usage

The TAM has two specific beliefs: that is, Perceived Ease of Use and Perceived Usefulness influence an individual's Behavioural Intention to use a new technology, which is subsequently linked to actual usage behaviour (Lai et al., 2008). These authors go on to state that system acceptance is predicted by Behavioural Intention, which is directly related to Perceived Ease of Use and Perceived Usefulness. According to Davis (1989), Perceived Usefulness is the strongest determinant of Behavioural Intention, followed by Perceived Ease of

Use. The author further states that Behavioural Intention is the major determinant of usage behaviour, and that usage behaviour is predictable from measuring Behavioural Intention, and any other factors that influence user Behaviour do so indirectly by influencing Behavioural Intention.

According to studies done by Davis (1989); Adams et al. (1992), system usage should be considered the primary indicator of technology acceptance, besides system usage and Behavioural Intention (the two most essential and commonly used dependent variables). In addition, system usage can be measured as actual usage (Szajna, 1996), reported usage (Adams et al., 1992), or assessed usage (Davis, 1989). Thus, Wu and Du (2012) suggest that there is a need for researchers to examine both actual and assessed usage in their studies to bring to light the true relationships between system usage and its antecedents. However, when dealing with hypothesis-supporting results, there is a need to use assessed usage rather than the actual usage or reported usage as the ultimate dependent variable. Likewise, the authors further suggest that system usage should not be substituted by Behavioural Intention but needs to be included as a required ultimate dependent variable.

Although the TAM is the most widely applied model of user acceptance and usage, there have been mixed findings in terms of statistical significance, direction, and magnitude (Ma and Liu, 2004). Most TAM studies are characterised by different methodological and measurement factors that result in conflicting and confusing findings that differ in terms of statistical significance, direction, and magnitude (Yousafzai et al., 2007b). However, these studies do not measure system use and thus self-reported use should serve as a relative indicator (Legris et al., 2003). The TAM shows few similarities when comparing self-reported (subjective) and computer-recorded (objective) measures of information technology (Straub et al., 1995; Szajna, 1996; Wynne and Chin, 1996).

2.8. Conclusion

In this chapter, the various models and theories of individual acceptance have been described. Prior to the development of TAM 3, there was the original TAM; the evolution of TAM 2, and thus TAM 3, have been described above. The constructs of TAM 3 have also been described, together with their respective anchors and adjustments. The TAM 3 studies conducted both in the Middle East and outside the Middle East have been described. However, due to the limitations of the studies done in the Middle East using the full TAM 3, the discussion was separated into the following categories: 1) studies focusing on Intention to Use, and 2) studies focusing on Attitude.

The social influence mechanisms—compliance, identification, and internalisation—have been reviewed in this chapter. Similarly, the anchors and adjustments of Perceived Ease of Use have been described. This was very important because they form a major contribution to the human decision-making process and it was felt that they would have a significant influence among Saudis. The KSA is known to have a very strong cultural background. Therefore, the cultural influence in relation to Subjective Norm has been reviewed. Studies done both in the Western and the non-Western context have been reviewed in terms of the influence of Subjective Norm on Behavioural Intention. In addition, Image and changes in social influence with Experience has been reviewed. This review was very important since studies have shown that, within the Western context, Experience has no moderating role, yet within the non-Western context, the effect of Subjective Norm becomes weaker with an increase in Experience.

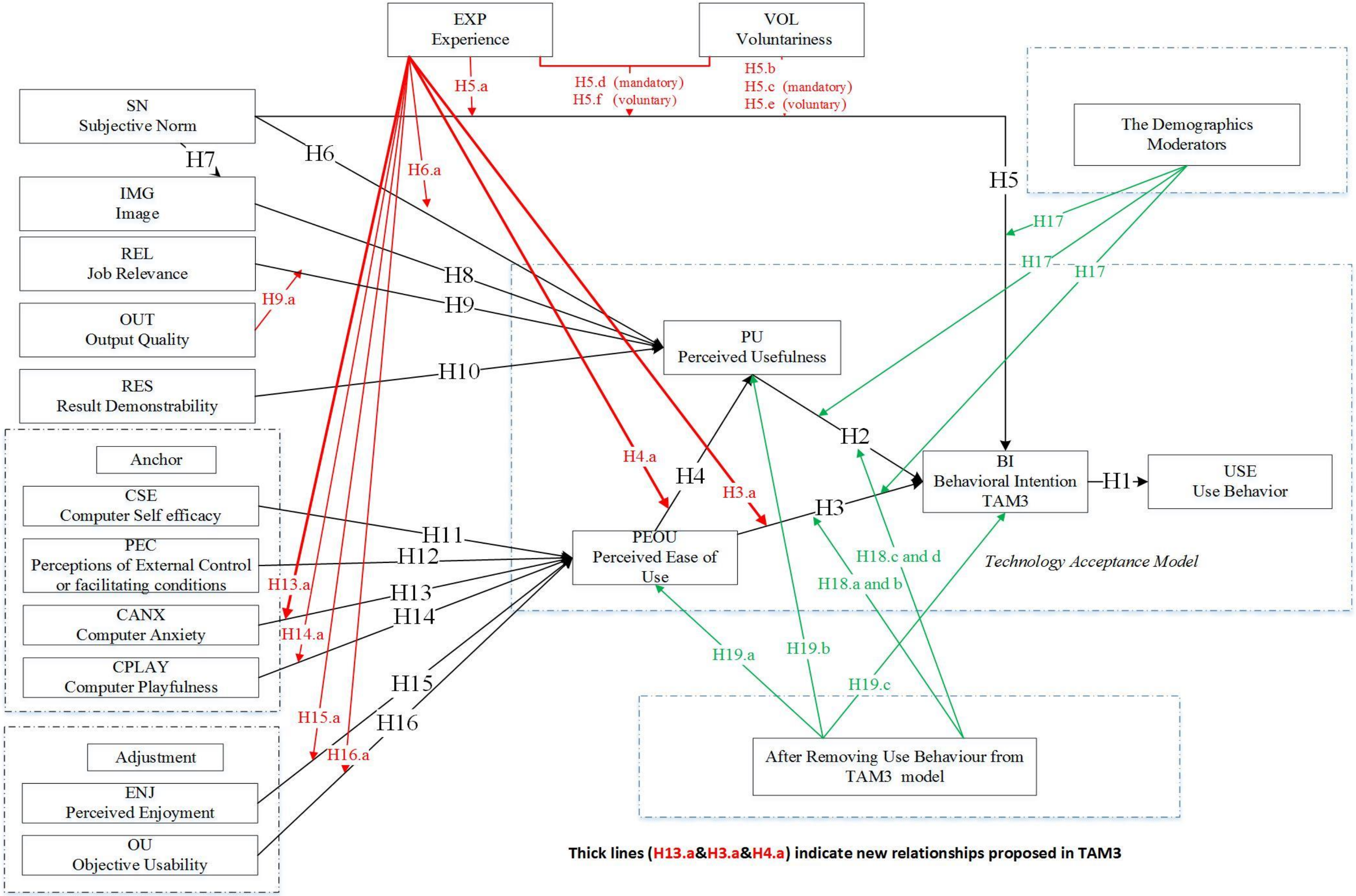
In the next chapter, several hypotheses are postulated in relation to TAM 3. These hypotheses are stated based upon a careful consideration of the literature review, especially of the studies that have used TAM 3.

3 CHAPTER THREE: THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

3.1. Introduction

In this chapter, a theoretical background is developed to identify the gaps and build the necessary hypotheses (see Figure 3-1) to be tested in the current study. The study features main hypotheses and several sub-hypotheses. The following antecedents are included in the study: Behavioural Intention, Perceived Usefulness, Perceived Ease of Use, Subjective Norm, Image, Job Relevance, Output Quality, Results Demonstrability, Computer Self-Efficacy, Perceptions of External Control, Computer Anxiety, Computer Playfulness, Perceived Enjoyment, and Objective Usability. The main constructs in the study are Behavioural Intention, Perceived Usefulness, Perceived Ease of Use and Use Behaviour.

Figure 3-1: A Diagram Representing the Hypotheses



3.2. The Effect of Behavioural Intention on Use Behaviour of the Noor System in Technology Acceptance Model 3

Behavioural Intention is defined as the "*individual's Intention to perform a given behaviour. ... The stronger the Intention to engage in a behaviour, the more likely should be its performance*" (Ajzen, 1991, p. 181). In TAM 3, Behavioural Intention is the central factor in the assessment of Use Behaviour. Al-Gahtani (2008) investigated the applicability of the TAM in the Arabic context by exploring three moderating factors. The study had foreign participants and thus was not purely based on a Saudi sample. Behavioural Intention was reported to have a strong positive direct influence on Use Behaviour relating to desktop computers among knowledge workers. Similarly, the author noted that the influence of Behavioural Intention on Use Behaviour had an indirect influence on Perceived Ease of Use, Perceived Usefulness, and Attitude towards the use of desktop computers, of which the mediation via Behavioural Intention was tested. Venkatesh and Bala (2008), using repeated measurements based on TAM 3, established Behavioural Intention to be a significant predictor of Use Behaviour in relation to new IT systems. Thus, based on this literature, it was hypothesised that

H1: Behavioural Intention will have a positive, significant and direct effect on Use Behaviour concerning the Noor system.

3.3. The Effect of Perceived Usefulness on Behavioural Intention in Technology Acceptance Model 3

The first research paper using the TAM published by Ghorab (1997) based on a United Arab Emirates sample, in the Middle East, reported that the Perceived Usefulness of the system was highly associated with System Usage and the Adopted Level of Technological Sophistication. The study concluded that Perceived Usefulness and Perceived Strengths were significant factors in adoption and use. In a study conducted in Kuwait by Aladwani and Aladwani (2002), the TAM was used to measure the ease of use and the usefulness of transactional websites. The authors reported that Website Usefulness correlated significantly with Intention to Purchase. In his study, Selim (2003) also used the TAM to assess the acceptance of a course website among undergraduate university students in the United Arab Emirates. The study reported that students would use the course website significantly more often if they perceive it to be useful and easy to use.

Akour et al. (2006) used TAM 2 to explore the impact of culture, Perceived Ease of Use, and Perceived Usefulness on the Intention of managers to use the internet. The authors reported a significant positive impact on managers' Intention to use the internet from Perceived Ease of Use and Perceived Usefulness. Al-Khateeb (2007) used an extended TAM to predict internet usage among college students in Chile and the United Arab Emirates. Perceived Usefulness was the only significant predictor of internet usage for the college students in both countries. In a study done by Al-Gahtani (2008) of knowledge workers in the KSA, using the TAM , Perceived Usefulness was reported to have a significant positive effect on the Behavioural Intention to use desktop computers. Upon testing the effect of gender and age as moderators, Al-Gahtani (2008) reported that gender had no significant moderating effect; however, age did have a significant moderation effect, especially with older individuals in the study. Anderson et al. (2011) used the Technology Acceptance Model 2 antecedents and the determinants of ease of use model to investigate the value of the TAM antecedents in global IS development and research in the KSA. They reported that Perceived Usefulness had a significant effect on the Behavioural Intention to use desktop computers. Similarly, a study was done by Harby et al. (2010) on biometric authentication systems in e-Commerce in the KSA, among online users of these systems, using the TAM . According to the study, Perceived Usefulness had a significant effect on users' Attitude towards biometric authentication in online banking. In the research conducted by Venkatesh and Bala (2008) that led to the development of TAM 3, the authors reported that Perceived Usefulness had a significant effect on Behavioural Intention. Therefore, based on the above literature, it was hypothesised that

H2: Perceived Usefulness will have a significant positive effect on the Behavioural Intention to use the Noor system.

3.4. The Effect of Perceived Ease of Use on Behavioural Intention

The Perceived Easiness of using a website was reported to strongly correlate with Intention to Purchase from the same website (an online bookstore) (Aladwani and Aladwani, 2002). In their exploratory analysis of culture, Akour et al. (2006) reported that Perceived Ease of Use had a significant positive effect on managers' Intention to use the internet. Similarly, Anderson et al. (2011)—using TAM 2 and the determinants of ease of use model—reported that Perceived Ease of Use had a significant positive effect on the Behavioural Intention of professional knowledge workers to use desktop computers. Lastly, Venkatesh and Bala (2008)—using TAM 3—reported that Perceived Ease of Use had a significant positive effect on the Behavioural Intention to use a new IT system. The authors also reported that Experience had a moderate positive moderation effect on the relationship between Perceived Ease of Use and Behavioural Intention, such that as the user's Experience increases, the moderation effect of Perceived Ease of Use on Behavioural Intention become weaker Hence, the current study has identified a gap in the limited studies that have assessed the role played by users' Experience in the relationship between Perceived Ease of Use and Behavioural Intention. Thus, it was hypothesised that

H3: Perceived Ease of Use will have a significant positive effect on the Behavioural Intention to use the Noor system.

H3a: Experience will have a significant negative effect on the Behavioural Intention to use the Noor system over time.

3.5. The Effect of Perceived Ease of Use on Perceived Usefulness

In a cross-sectional survey study done by Rose and Straub (1998) predicting general IT use in the Arabic world, focusing on five Middle Eastern countries including the KSA, it was reported that Perceived Ease of Use was strongly related to Perceived Usefulness. In his study, Selim (2003) reported that a website's Ease of Use had a significant positive effect on the website's Usefulness.

Studies by Al-Gahtani (2008); Anderson et al. (2008); Anderson et al. (2011) have all reported that Perceived Ease of Use had a significant positive effect on Perceived Usefulness among professional knowledge workers, with respect to the use of desktop computers in the KSA. Similarly, the studies done by Harby et al. (2010); Alharbi and Drew (2014)—both conducted in the KSA—reported that Perceived Ease of Use had a significant positive effect on Perceived Usefulness.

A study done in Jordan by Al-Adwan et al. (2013) also reported a significant effect of Perceived Ease of Use on Perceived Usefulness among college students using e-Learning systems. Lastly, Venkatesh and Bala (2008)—using TAM 3—reported that Perceived Ease of Use had a significant positive effect on the influence of Perceived Usefulness on Use Behaviour relating to a new IT system. Similarly, the authors reported users' Experience as having a moderation effect on the influence of Perceived Ease of Use on Perceived Usefulness, whereby the effect became stronger with an increase in Experience (Venkatesh and Bala (2008). The current study identified a literature gap in terms of the impact of Experience on the relationship between Perceived Ease of Use and Perceived Usefulness. Thus, it was hypothesised that

H4: Perceived Ease of Use will have a significant positive effect on Perceived Usefulness to use the Noor system.

H4a: Experience will have a stronger positive and significant moderation effect on the influence of Perceived Ease of Use on the Perceived Usefulness of using the Noor system over time.

3.6. The Effect of Subjective Norm on Behavioural Intention

Only one study was reported to have tested the effect of Subjective Norm on Behavioural Intention. In a study using TAM 2, done by Baker et al. (2010), it was reported that Subjective Norm had a significant positive effect on Behavioural Intention, which was mediated via Perceived Usefulness. The authors also noted that Voluntariness had no significant moderation interaction on the influence of Subjective Norm on Behavioural Intention. Venkatesh and Bala (2008) reported that Subjective Norm had a significant positive effect on the Behavioural Intention to use a new IT system. Similarly, they reported a significant three-way interaction between Subjective Norm, Experience and Voluntariness on Behavioural Intention. In the voluntary context, as Experience increased, the effect of Subjective Norm on Behavioural Intention becomes weaker. However, the effect of Subjective Norm on Behavioural Intention in a mandatory context becomes stronger, in a two-way interaction between Subjective Norm and Voluntariness. Thus, numerous literature gaps were identified regarding the effect of Subjective Norm on Behavioural Intention. Thus, it was hypothesised that

H5: Subjective Norm will have a significant positive effect on Behavioural Intention to use the Noor system.

H5a: Experience will have a significant negative moderation effect on Behavioural Intention to use the Noor system.

H5b: Voluntariness will moderate the effect on Behavioural Intention to use the Noor system.

H5c: Voluntariness will have a significant positive moderation effect on Behavioural Intention to use the Noor system in the mandatory context.

H5d: A three-way interaction between Subjective Norm, Experience and Voluntariness will have a weaker, negative, significant moderation effect on Behavioural Intention to use the Noor system in the mandatory context.

H5e: Voluntariness will have no significant moderation effect on Behavioural Intention to use the Noor system in the voluntary context.

H5f: A three-way interaction between Subjective Norm, Experience and Voluntariness will have a weaker, negative, significant moderation effect on Behavioural Intention to use the Noor system in the voluntary context.

3.7. The Effect of Subjective Norm on Perceived Usefulness

Studies by Anderson et al. (2008), Baker et al. (2010) and Anderson et al. (2011)—all using TAM 2 in the context of the KSA have reported that Subjective Norm has a significant positive effect on Perceived Usefulness. However, these three studies are subject to criticism as the papers were published at different times using the same data set (from Al-Gahtani (2003)). In TAM 3, as developed by Venkatesh and Bala (2008), Subjective Norm was reported to have a significant positive effect on the Perceived Usefulness of a new IT system. The effect of Experience on Subjective Norm and Perceived Usefulness has been investigated by Venkatesh and Bala (2008); Baker et al. (2010). The two studies agree that the effect of Experience on the relationship between Subjective Norm and Perceived Usefulness attenuates over time, meaning that its effect becomes weaker. Thus, it was hypothesised that

H6: Subjective Norm will have a significant positive effect on the Perceived Usefulness of the Noor system.

H6a: Experience will negatively moderate the effect of Subjective Norm on the Perceived Usefulness of the Noor system, with the effect becoming weaker as Experience increases.

3.8. The Effect of Subjective Norm on Image

In the context of the Middle East and the KSA, only one study has been published—by Baker et al. (2010)—that investigates the relationship between Subjective Norm and Image. According to Baker et al. (2010), Subjective Norm had a strong positive direct effect on Image. In the TAM 3 study done by Venkatesh and Bala (2008), the effect of Subjective Norm on Image was positive and significant in all three of the repeated measurements. Thus, it was hypothesised that

H_7: Subjective Norm will have a significant positive effect on Image when using the Noor system.

3.9. The Effect of Image on Perceived Usefulness

Studies by Anderson et al. (2008); Baker et al. (2010); Anderson et al. (2011) in the KSA have reported that Image has a significant positive effect on Perceived Usefulness. All three of the studies used TAM 2, although Anderson et al. (2008); Anderson et al. (2011) added the determinants of ease of use to TAM 2. According to the TAM 3 study done by Venkatesh and Bala (2008), Image was a significant predictor of Perceived Usefulness. Thus, it was hypothesised that

H8: Image will have a significant positive effect on the Perceived Usefulness of the Noor system.

3.10. The Effect of Job Relevance on Perceived Usefulness

Two studies were identified that addressed the effect of Job Relevance on Perceived Usefulness within the Middle East context. According to Baker et al.

(2010, p. 41), Job Relevance *"is among the four cognitive instruments that people use for assessing the match between important work goals and their perceptions of the usefulness of a given system"*. Job Relevance had a positive direct effect on Perceived Usefulness (Baker et al., 2010). Similar findings were reported by Alharbi and Drew (2014). Lastly, using TAM 3, Venkatesh and Bala (2008) reported that Job Relevance had a significant positive effect on Perceived Usefulness where Job Relevance and Output Quality had an interactive effect on Perceived Usefulness; that is, as Output Quality increases, the effect of Job Relevance on Perceived Usefulness becomes stronger. Thus, it was hypothesised that

H9: Job Relevance will have a significant positive effect on the Perceived Usefulness of the Noor system.

H9a: Output Quality will strongly moderate the effect of Job Relevance on the Perceived Usefulness of the Noor system.

3.11. The Effect of Results Demonstrability on Perceived Usefulness

Studies done by Anderson et al. (2008); Baker et al. (2010); Anderson et al. (2011) in the KSA have reported that Results Demonstrability had a significant positive effect on Perceived Usefulness. Similarly, using TAM 3, Venkatesh and Bala (2008) reported that Results Demonstrability was a significant predictor of Perceived Usefulness. Thus, it was hypothesised that

H10: Results Demonstrability will have a significant positive effect on the Perceived Usefulness of the Noor system.

3.12. The Effect of Computer Self-Efficacy on Perceived Ease of Use

The studies done by Anderson et al. (2008); Anderson et al. (2011) in the KSA reported that Computer Self-Efficacy had a significant positive effect on Perceived Ease of Use. However, the authors' studies combined the determinants of ease of use with TAM 2. Venkatesh and Davis (2000) have described Computer Self-Efficacy as one of the main determinants of Perceived Ease of Use. By using TAM 3, Venkatesh and Bala (2008) were able to report that Computer Self-Efficacy had significant effects on Perceived Ease of Use. Thus, it was hypothesised that

H11: Computer Self-Efficacy will have a significant positive effect on Perceived Ease of Use when using the Noor system.

3.13. The Effect of Perceptions of External Control on Perceived Ease of Use

Of all the TAM studies that were reviewed, none of the studies from the Middle East assessed the influence of Perceptions of External Control on Perceived Ease of Use. From using TAM 3, Venkatesh and Bala (2008) reported that Perceptions of External Control was a significant predictor of Perceived Ease of Use. Therefore, there exists a huge gap concerning the assessment of the effect of Perceptions of External Control on Perceived Ease of Use. Thus, it was hypothesised that

H12: Perceptions of External Control will have a significant positive effect on Perceived Ease of Use when using the Noor system.

3.14. The Effect of Computer Anxiety on Perceived Ease of Use

The studies done by Anderson et al. (2008); Anderson et al. (2011) in the KSA reported that Computer Anxiety had a significant negative effect on Perceived Ease of Use. Based on TAM 3, Venkatesh and Bala (2008) reported that Computer Anxiety had a moderate significant positive effect on Perceived Ease of Use, such that the effect of Computer Anxiety on Perceived Ease of Use was moderated by Experience. This meant that, as Experience increased, the effect became weaker: that is, the effect of Experience attenuates with time. This shows that there are still certain gaps that needs to be addressed by future studies. Thus, it was hypothesised that

H13: Computer Anxiety will have a moderate significant effect on Perceived Ease of Use when using the Noor system.

H13a: Experience will negatively moderate the effect of Computer Anxiety on Perceived Ease of Use over time, when using the Noor system.

3.15. The Effect of Computer Playfulness on Perceived Ease of Use

Based on TAM 3, Venkatesh and Bala (2008) reported that Computer Playfulness had a significant positive effect on Perceived Ease of Use, although Experience was reported to have a negative moderating effect on the relationship between Computer Playfulness and Perceived Ease of Use. Likewise, this meant that as Experience increases over time, its effect declines. This shows a huge gap in terms of the literature regarding the effect of Computer Playfulness on Perceived Ease of Use, and also Experience as a moderating factor in their relationship. Thus, it was hypothesised that

H14: Computer Playfulness will have a significant positive effect on Perceived Ease of Use when using the Noor system.

H14a: Experience will negatively moderate the effect of Computer Playfulness on Perceived Ease of Use over time, when using the Noor system.

3.16. The Effect of Perceived Enjoyment on Perceived Ease of Use

As Experience increases, the effect of Computer Playfulness on Perceived Ease of Use diminishes with time (Venkatesh and Davis, 2000). The studies done by Anderson et al. (2008); Anderson et al. (2011) in the KSA reported that Perceived Enjoyment had a significant positive effect on Perceived Ease of Use. Venkatesh and Bala (2008) reported that Perceived Enjoyment had a significant positive effect on Perceived Ease of Use. However, with the initial introduction of the system, Perceived Enjoyment did not have any significant effect on Perceived Ease of Use. Nevertheless, they showed that its significance increases with the passing of time. Thus, Experience was reported to positively moderate the relationship between Perceived Enjoyment and Perceived Ease of Use. This shows that the effect of Perceived Enjoyment on Perceived Ease of Use becomes stronger as Experience increases. A gap was identified concerning the role played by Experience as a moderating factor in the relationship between Perceived Enjoyment and Perceived Ease of Use. Thus, it was hypothesised that

H15: Perceived Enjoyment will have a significant positive effect on Perceived Ease of Use when using the Noor system.

H15a: Experience will positively moderate the effect of Perceived Enjoyment on Perceived Ease of Use over time, when using the Noor system.

3.17. The Effect of Objective Usability on Perceived Ease of Use

In a study conducted by Venkatesh (2000), Objective Usability had a significant effect on Perceived Ease of Use as the user's Experience increased. Similarly, using TAM 3, Venkatesh and Bala (2008) assessed the effect of Objective

Usability on Perceived Ease of Use. Objective Usability was reported to have a more significant effect on Perceived Ease of Use as time elapsed. Hence, users' Experience was reported to have a positive moderating effect on the relationship between Objective Usability and Perceived Ease of Use. The effect became stronger as Experience increased. Thus, a gap was identified regarding the general effect of Objective Usability on Perceived Ease of Use, and the moderating effect of Experience in the relationship between them. Thus, it was hypothesised that

H16: Objective Usability will have a significant positive effect on Perceived Ease of Use when using the Noor system.

H16a: Experience will positively moderate the effect of Objective Usability on Perceived Ease of Use over time, when using the Noor system.

3.18. The Effect of Additional Moderators of Perceived Ease of Use and Perceived Usefulness for the Noor System Users

New relationships were proposed in TAM 3 suggesting that Experience would moderate the relationship between Perceived Ease of Use and Perceived Usefulness, such that by increasing hands-on Experience with a system, the end user would attain more information concerning the easiness and difficulties of using the system (Venkatesh and Bala, 2008). In TAM 3, Experience was the only demographic moderator to be tested. In the current study, Perceived Ease of Use and Perceived Usefulness are the main constructs. Thus, to test the Noor end-user system effectively, several factors were chosen as potential moderators of the effects of Perceived Usefulness and Perceived Ease of Use on the Noor system's end-user system behaviour. To this end, the following additional factors were considered and tested as moderators: Age, Gender, Training, Internet Access at Work, Internet Access at Home, Internet Experience, Internet Proficiency, Education Level and Nationality.

H17a: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Groups.

H17b: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Nationality (Saudi/non-Saudi).

H17c: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Experience with using the system.

H17d: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Gender.

H17e: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Internet Proficiency.

H17f: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Internet Access at Work.

H17g: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Internet Access at Home.

H17h: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Internet Experience.

H17i: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Age.

H17j: The influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will not be moderated by Educational Level.

The literature review suggested that TAM 3 has not been fully tested within the context of the Middle East, and in particular, in the KSA . Summarising these reviews, a meta-analysis conducted by Yousafzai et al. (2007a, p. 251) stated that *"although, in the last 20 years, the Technology Acceptance Model has become well established as a robust, parsimonious, and powerful model for predicting users' acceptance of technology, few studies have attempted to validate the full Technology Acceptance Model with all of its original constructs"*. Therefore, in the current study, an attempt was made using several demographic variables as moderators to test their effect on the influence of Perceived Ease of Use and Perceived Usefulness on Behavioural Intention with respect to the Noor system end user.

3.19. The Effect of Perceived Ease of Use and Perceived Usefulness on Behavioural Intention upon Removing Use Behaviour from Technology Acceptance Model 3

User Behaviour is a fundamental research topic in information systems, with information systems researchers recognising it as the primary indicator of technology acceptance (Davis, 1989; Adams et al., 1992; Karahanna et al., 2006). In their meta-analysis study, Wu and Du (2012) posit that, when

Behavioural Intention is used as the final dependent variable, significant, hypothesis-supporting results are very likely to be obtained; however, when actual usage is used, significance may not be observed for the predicted paths. Moreover, Wu and Du (2012, p. 690 & 691) also state that "*editors, reviewers, and readers need to be highly circumspect of behavioural studies not investigating usage but only individuals' intentions*". The study further reports that "*the variance explained in usage was much less than the explained variance in Behavioural Intention which suggested that a research model predicting Behavioural Intention may not predict system usage*".

The TAM is a completely deterministic model, such that when an independent variable increases (decreases), the dependent variable is expected to increase (decrease) (Bagozzi, 2007). According to Agudo-Peregrina et al. (2014), many studies on technology acceptance models focus on explaining Behavioural Intention, while taking the linkage between Intention and Use Behaviour for granted. The authors further suggest that system usage can be measured using three methods—actual usage, assessed usage, and reported usage—although "*none of these measures are helpful when the system is not implemented or the individuals have not had a hands-on experience with the system yet*" (Agudo-Peregrina et al., 2014, p. 304).

When using TAM 3, Hu et al. (2014) did not measure Use Behaviour; the authors asserted that the choice to measure technology acceptance using intention was appropriate, since measuring usage would require an assessment of people's beliefs and attitudes in the preceding period.

The studies done by Rawstorne et al. (1998); Nah et al. (2004); Lee and Park (2008) suggest that, in a mandatory context, the Use Behaviour construct should be removed from the model because the user has no choice but to use the system as a result of the organization's policies.

H18a: Perceived Ease of Use will not have a significant effect on Behavioural Intention when Use Behaviour is removed from TAM 3 under the self-reported usage system.

H18b: The beta estimate for the relationship between Perceived Ease of Use and Behavioural Intention will not change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

H18c: Perceived Usefulness will not have a significant effect on Behavioural Intention when Use Behaviour is removed from TAM 3 under the self-reported usage system.

H18d: The beta estimate for the relationship between Perceived Usefulness and Behavioural Intention will not change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

3.20. The Effect of Removing Use Behaviour on the Explained Variance in Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness

H19a: The explained variance in Perceived Ease of Use will not change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

H19b: The explained variance in Perceived Usefulness will not change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

H19c: The explained variance in Behavioural Intention will not change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

3.21. Conclusion

In this chapter, all 19 of the main hypotheses were developed based on the literature reviews and on phone calls to a number of Noor system users in the KSA, as well as general face-to-face interviews. The main TAM has 16 hypotheses. However, due to the testing of the additional moderators that have been introduced in this study, the number of hypotheses has increased to 19, of which three were considered as sub-hypotheses related to socio-demographic variables. The addition of these demographics as moderators was to test their role and applicability to the Noor system in relation to TAM 3.

It is worth mentioning that all the hypotheses mentioned in this chapter under the H17s, have not yet been proposed for TAM 3. This means there is an opportunity in the current study to explore new contributions that may be worth investigating. TAM 3 presents no limitations to the exploration of new relationships (Venkatesh and Bala, 2008). Moreover, the data collected should allow a comparison to be made between Saudi and non-Saudi. This attention to nationality is intended to bring to light the differences between the two groups, regarding their use of the Noor system.

What has become clear in this chapter is that there are 19 hypotheses in this study. These hypotheses have been developed based on the objectives, that have been postulated in chapter 2. Hypotheses one to 16 are meant to investigate TAM 3 model based on objectives number one and two. The effect of demographics and additional moderators will be investigated using hypotheses 17a to 17j which represents objective number three. Objective number four will be achieved by investigating hypotheses 18a to 18d, while objective number five will be investigated using hypotheses number 19a to 19c. (see Table 11.73 in Appendix O). Research methodology is very important before commencing any study because it acts as the frame that will guide the way a research will be performed (Thomas, 2013). Therefore, in the following chapter, an attempt will be made to describe the research methodology that has been used in this study.

In the next chapter, an attempt will also be made to explain the development of the survey instruments. It is worth mentioning that, in this study, three groups were under investigation: teachers, parents, and students. Therefore, the development and design of the three questionnaires will be described. Attention will be paid to the framing of the questions because some questions were only relevant to a specific group of persons in the study.

4 CHAPTER FOUR: RESEARCH METHODOLOGY

4.1. Introduction

This chapter discusses the research methodology, philosophy, approach and design, sampling, the sample size, and the data analysis techniques employed in the current study. It describes the instrument development and constructs operationalisation, the reliability and validity, the design of the questionnaires (see Appendix D, Appendix E, and Appendix F), the translation process, the preliminary interviews, the pilot survey, and the main study data collection procedure. The hypothetico-deductive method was adopted for the current study, since Venkatesh et al. (2013, p. 25) stated that *"interviews can provide depth in research inquiry by allowing researchers to gain deep insights from rich narratives, and surveys"*.

Research methodology was defined by Somekh and Lewin (2005, p. 346) as "*the collection of methods or rules by which a particular piece of research is undertaken*", and as the "*principles, theories and values that underpin a particular approach to research*". Meanwhile, Mackenzie and Knipe (2006) described methodology as *"the overall approach to research linked to the paradigm or theoretical framework",* stating that method "*refers to systematic modes, procedures or tools used for collection and analysis of data*". The research methodology and methods employed for this current research were selected to enable the successful achievement of the research aim and objectives. This chapter discusses the justification of the choice, and the use of the methodologies and methods employed in terms of the research philosophy/epistemology, the research approach and design, and the sampling procedures and design. It concludes with a summary of the chapter.

4.1.1. Research Philosophy/Epistemology

According to Oates (2006), the concept of philosophy, which regards the knowledge that is viewed as acceptable in a social enquiry, originated in the era of Socrates. Philosophy concerns the way in which knowledge is sought and gained in the particular field under study. Meanwhile, Oates (2006, p. 282), defined paradigm as "*a set of shared assumptions or ways of thinking about some aspect of the world*", which engenders research strategies in the form of methodologies and techniques that are adopted by researchers. He further stated that several philosophical paradigms exist, each of which perceives differently the nature of our world (ontology), and how knowledge concerning it is obtained. Similarly, Lee (2004, p. 5) explained that "*a scholarly school of thought's ontology comprises its members' foundational beliefs about the empirical or 'real' world they are researching*", and that epistemology is "*a broad and high-level outline of the reasoning process by which a school of thought performs its logical and empirical work*".

Positivism and interpretivism are different philosophical perceptions that arise during the process of interpreting knowledge and understanding the social world. Bryman (2012); Saunders et al. (2012) explained that a positivist researcher embraces natural sciences methods, while an interpretivist researcher assumes that a difference exists between the subject matter of social science and the natural sciences.

4.1.2. Positivism and Interpretivism Paradigms

4.1.2.1. Positivism

Positivism is "*an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond*" (Bryman, 2012, p. 28). The term positivism originated in the nineteenth century work of the French philosopher, Auguste Comte (Thomas, 2013). According to Bryman (2012), a positivist researcher employs deductible strategies in their inquiry, thereby generating a hypothesis prior to the collection of data, which is used to accept or reject the null hypothesis formulated. Similarly, Thomas (2013) stated that a positivist assumes that they attain knowledge about their social world objectively.

4.1.2.2. Interpretivism

Interpretivism possesses a different view from positivism. Creswell (2014, p. 8) explained that interpretivist researchers "*seek understanding of the world in which they live and work*", and that they "*develop subjective meanings of their experiences - meanings directed toward certain objectives or things*", and thus, Sekaran and Bougine (2013) described interpretivists as researchers who are mainly interested in understanding the world from the angle of the social actors, and who prefer not to generalise their findings. According to Thomas (2013); Creswell (2014), an interpretivist researcher interprets the world views of other individuals by developing a theory or pattern based on the subjective and multiple reality view. Therefore, in interpretivism, qualitative methods are associated with enquires concerning a specific phenomenon (Sekaran and Bougine, 2013).

In summary, positivism and interpretivism constitute different views of the social world, and they also differ in terms of the way in which knowledge is sought and acquired through social inquiry (Bryman, 2012; Thomas, 2013). The research methodology employed for the current study was adapted from that of Sekaran and Bougine (2013), since the main aim of this study was to investigate the applicability of TAM 3 in the context of the KSA, therefore a positivism paradigm was the most relevant paradigm to employ in its investigation and discussion.

4.2. Research Approach and Design

4.2.1. Research Approach

A research approach can be either quantitative or qualitative, and can be described as the way in which data is used and generated. Saunders et al. (2012) stated that the quantitative approach is associated with data collection, and with analysis that involves numbers. Quantitative methods were first applied in the natural sciences to investigate natural occurrences. Quantitative research employs surveys, assessments, and experiments, approaches which, according to Myers (1997), facilitate the description and testing of the relationships, and investigate the cause and effect interactions among variables. In the current study, a hypothetico-deductive method was adopted. According to Jones (2015) deductive research is associated with positivist and quantitative research that involves the development of an idea or hypothesis from an existing theory, and with testing relationship(s) through the collection of data. He stated that deductive research commences with the formulation of the statement that underpins the research, and is followed by the deducing of the statement (hypothesis), and then by the data collection, the findings of which are used to confirm, modify, or refute the theory that was used to develop the hypothesis.

This current research concerned the Noor system, which employs a quantitative approach. Therefore, the study was classified as positivist, and thus the hypothetico-deductive method was adopted. Several assumptions regarding real life scenarios and the subjects involved in the research were made, in order to facilitate an objective study. Statistical operations were conducted on the data collected in order to demonstrate its reliability, and to allow the generalisation of the results to a larger population. Since self-reported questionnaires were employed for the data collection, the study adopted a quantitative approach.

4.2.2. Research Design

A research design can be described as frame that guides the way in which a research project is conducted, and Thomas (2013) stated that the selection of a certain design frame is determined after deciding the research scenario to be adopted. Numerous research designs exist, including case studies, surveys, evaluation, experiment, action research, and comparative research, all of which form the basis of the structure of a research design.

4.3. Sampling Procedures and Designs

4.3.1. Target Population

The current study's target population was comprised of Noor system users who interact directly with the system in context of the educational sector in the KSA, the end users of which should have a registered email account with the Ministry of Education (MOE). The Noor system serves approximately 10 million users, covering 37,000 schools, and providing more than 2,763 different functions and e-services for a variety of individuals, including students, teachers, administrators, higher education institutions, and other interested stakeholders (Abu-Ghazaleh, 2012).

4.3.2. Sampling Frame

Saunders et al. (2012) explained that sampling is a technique that is employed in research that allows the collection of data from a subgroup, rather than from an entire group, through improving the sample representativeness. Sampling can be performed using a stratifying technique, which divides the sample population into subgroups, based on one or more characteristics, and which selects random samples from among them via the simple random technique. In the current study, the target population was confined to the registered Noor users, and the sampling frame was divided into three groups: the teachers, the students, and the parents.

4.3.3. Sampling Technique

According to Marshall (1996), the selection of a study sample is an important step in any research project, as it is rarely practical, efficient, or ethical to study whole populations. Therefore, in the current study, the stratified random sampling method was adopted. Stratified sampling was conducted on the participants to be surveyed by dividing the sample population into three groups: students, parents, and teachers, since O'Leary (2004) stated that the stratified sampling technique allows all categories of users under different contexts to be represented in the sampling process.

The minimum sample size required to represent the population was calculated using the following formula, where n was the sample size, K was the desired confidence level, S was the sample standard deviation, and E was the required level of precision:

$$n = (K \times S / E)^2$$

The required level of precision, or the margin of error allocated to E was the figure that represented the acceptable tolerance above or below the mean. In the current study, a 5% margin of error was chosen, and it indicated a 5% variation in responses above or below the acceptable mean level. The confidence level was the measure of how accurate the results of the questionnaires were. According to O'Leary (2004), this should be expressed as a percentage, and it shows how likely a response is within the confidence interval or margin of error.

At a 95% confidence level, and 5% required level of precision, the minimum sample size for a population of 10 million users was 384 participants, which would be considered a sufficient representative sample, assuming that all of the participants took part in the survey. However, since this is rare in practice, it was necessary to allow for those participants who chose not to respond to the questionnaires. Therefore, the response rate was estimated at 50%, and thus, the actual number of questionnaires to be distributed was a minimum of 768. However, because structural equation modelling (SEM) requires large sample size (Khine, 2013), this selection was reviewed in detail while assessing the suitable sample size under section 4.10.3.

The participants in this current research were categorised into three groups. The first group was comprised of both male and female teachers from primary, intermediate, and secondary schools; the second group of both male and female students at secondary schools; and the third group of both male and female parents. It is important to note that the survey was only sent to individuals with a registered email account on the Noor system. It should also be noted that due to cultural and religious limitations imposed on the communication between men and women in the KSA, the preliminary interviews were only conducted with the male participants. However, both genders were requested to participate in the self-reported questionnaire.

4.4. Reliability and Validity of the Questionnaires

The reliability and validity of questionnaires is vital for any research project, and credibility is lost when studies lack reliability and validity checks. Closed questions improve the reliability of the items measured (Dey, 1993), and a reliable researcher enables other researchers wishing to replicate the same procedures to produce similar findings. Dey (1993, p. 259) explained that *"reliability is not primarily an empirical issue at all, but a conceptual one. It has to be rooted in a conceptual framework which explains why in principle we can expect a measuring instrument to produce reliable results",* which in turn improves the internal reliability of the data collected. The reliability of the current study was assessed using Cronbach's alpha coefficient tests on the items in the preliminary questionnaires. Nunnally (1978) recommended that the minimum Cronbach's alpha value should be .70.

Validity is the degree to which a measure, or set of measures, are free from any systematic or non-random error (Hair et al., 2014). The validity of the measurement instruments is vital, as it improves the confidence in the study. The validity in the current study was assured by interviewing and issuing the questionnaires to the appropriate group of respondents identified in the study, in terms of teachers, students, and parents, as they were the most likely users of the Noor system. Vogelsang et al. (2013, p. 13), explained that *"direct dialogue replaces the need to work with controversial constructs like use or intention to use",* and that the technology qualitative approach allows a theory building process thus identifying factors that impact on software acceptance whereby the influencing parameters can be derived from the statements of the interviewees. The questionnaires were therefore developed using the basic requirements for SEM.

4.5. Questionnaire Design

The questionnaires were designed and developed using different formats, namely, a seven-point Likert scale, which was employed for all of the items to be measured, apart from Computer Self-Efficacy, which was measured using a 10-point Guttman scale. This restricted the respondents from providing responses outside of the designated choices, and ensured that the initial assessment of the questions in the questionnaires were reliable and consistent with the objectives of the study.

Barrow (1999) stated that questionnaires are crucial instruments for investigating a number of variables in different contexts, in a given period of time. However, although questionnaires can be used to collect information from many users within a short period of time, they are limited to the number and the type of questions they include. Online questionnaires are a quick and effective ways to obtain information, provided the researcher has identified a concise research question to be investigated, which employs specified variables (Sekaran and Bougine, 2013). Furthermore, online questionnaires are cost-effective as they are paperless, more convenient, and easier to circulate to respondents from diverse geographical locations. However, proficiency in the use of computers, and the willingness to complete an online questionnaire, limits the use of online survey instruments.

4.6. Translations

The initial questionnaires were developed in English. However, prior to collecting the main data, the questionnaires were translated into Arabic, for the benefit of the respondents who were unfamiliar with the English language, as it is the official language of the KSA. In order to ensure the validity of the questions, the translation was conducted by two separate translators, who later validated the final Arabic version of the questionnaire. The translation process ensured that there were no limitations in the questionnaire design, as it tested the wording of the questions, along with the layout, the appearance, the sequence of the questions, and the time spent completing the questionnaire by the respondents.

4.7. Pilot Survey

A pilot study was conducted prior to the main data collection process to test the validity of the proposed questions, and in order to ensure the avoidance of direct questions that would produce highly correlated responses. This would have raised the issue of multicollinearity, which would have caused difficulties in analysing the data collected using SEM in Analysis of MOment Structures (AMOS). A pilot study involving a much smaller sample group, all of whom resided in the Al Qassim province of the KSA was randomly selected to test whether the questionnaires could capture the data required to meet the research objectives. The outcome of the pilot study engendered certain modifications of the questionnaire, in relation to the question format and the phrases used, in order to ensure its easier comprehension. The approximate time required to complete the survey was found to be between 15 and 20 minutes.

The main aim of the pilot study was to test the validity of the research method and tools used, and also to test the delivery methods decided upon for the questionnaire. It was a vital step, intended to (1) validate the research method that was adopted by the study; (2) test the delivery methods decided upon for the questionnaire; (3) gather the information that would test the effectiveness of the chosen delivery methods of the questionnaire; and (4) select the suitable analytical tools for the main data to be collected. The pilot study questionnaires were emailed to a total of 42,745 participants (see Table 4.1). These participants had registered email addresses that were listed as the email account for their use of the Noor system. The table below describes the sample involved in the pilot study. The data for the parents was generalised, and the table states ‘NA’ in the gender column, as the officials from the MOE did not provide the data based on gender.

Table 4.1: The Pilot Study Sample (Source: MOE Noor Administrator, 2014)

Groups	Teachers'	Students'	Parents'
Male	9,007	16,950	NA
Female	11,895	16,596	NA
Total	20,901	33,545	64,002
Have an Email	11,941	20,804	10,000
Total emails	42,745		
Responses	366	5	32
Response rate	3.07 %	0.02 %	0.32 %
Total response rate	3.41%		

NA: Not been provided from the source

Pilot studies offer researchers the opportunity to gather different opinions and comments regarding a questionnaire. The response rate for the fully completed questionnaire in the current pilot study was 3.41%, which was important because it facilitated the reliability testing of the items under investigation. The participants were requested to provide their opinions, and to comment on the questionnaire regarding the Noor system, and the responses were used to modify the final questionnaire. These modifications included deleting certain demographics that were deemed irrelevant for the study, and amending the length and clarity of certain questions, which received complaints from some of the participants.

4.8. Development of the Questionnaire

The design of the research survey was initiated by first collecting general information through preliminary interviews, and through a literature review of the questions previously involved in Technology Acceptance Model studies. The preliminary interviews were conducted prior to compiling the questionnaire, in order that the qualitative data and theoretical evidence could be employed to design a questionnaire that would focus on the relevant research questions for the Noor system users. Sekaran and Bougine (2013) stated that when designing an objective questionnaire, three aspects of the research processes should be considered, namely, (1) the phraseology used in the questionnaire; (2) the classification, scaling, and coding; and (3) the layout of the survey.

Previous studies conducted by Teo et al. (2008); Chuttur (2009); Baker et al. (2010); Al-Gahtani (2011); Sentosa and Mat (2012); Cheung and Vogel (2013); Lee et al. (2013); Mohammad Abu-Dalbouh (2013); Padilla-Melendez et al. (2013) were reviewed, and employed in designing the questionnaire used for the current study, in order to measure the acceptance of the independent users. These studies confirmed that the original TAM 3 questionnaire (see Table 11.50, Appendix C) should be comprised of 52 items (questions/indicators), with 51 questions employing a seven-point Likert scale, while the questions regarding Computer Self-Efficacy should employ a 10-point Guttman scale. See Table 4.2 for the source of the constructs, and Table 4.3 for the socio-demographics used.

Table 4.2: The Source for the TAM 3 Constructs

First part: TAM 3 constructs	**Source**
Use Behaviour	(Davis, 1989; Davis et al., 1989; Venkatesh and Bala, 2008)
Behavioural Intention	(Davis, 1989; Davis et al., 1989)
Voluntariness	(Moore and Benbasat, 1991)
Experience	(Venkatesh, 2000)
Perceived Usefulness	(Davis, 1989; Davis et al., 1989; Venkatesh, 2000)
Subjective Norm	(Taylor and Todd, 1995b)
Image	(Moore and Benbasat, 1991)
Job Relevance	(Davis et al., 1992)
Output Quality	(Davis et al., 1992)
Results Demonstrability	(Moore and Benbasat, 1991)
Perceived Ease of Use	(Davis, 1989; Davis et al., 1989; Venkatesh, 2000)
Perceptions of External Control	(Mathieson, 1991; Taylor and Todd, 1995b)
Computer Anxiety	(Brown and Vician, 1997)
Objective Usability	(Card et al., 1980)
Perceived Enjoyment	(Davis et al., 1992)
Computer Playfulness	(Webster and Martocchio, 1992)
Second part: TAM 3 constructs	**Source**
Computer Self-Efficacy	(Compeau and Higgins, 1995)

Table 4.3: The Socio-Demographics Used in the Noor System Study

Third part: The Demographic Data	**Source**
Teachers', Students' and Parents'	
Age	The literature
Gender	The literature
Home Region	The preliminary interviews
Home Location	The preliminary interviews
Experience Using Noor	The literature
Attending Training	The literature & The preliminary interviews
Training Source	The literature & The preliminary interviews
Receiving Support with Noor System Account	The preliminary interviews
Used Noor System Help and Support	The preliminary interviews
Help and Support	The literature & The preliminary interviews
Internet Access Home	The literature & The preliminary interviews
Internet Experience	The literature & The preliminary interviews
Internet Proficiency	The literature & The preliminary interviews
Internet Usage	The literature & The preliminary interviews
Average Time for Using the Internet	The literature & The preliminary interviews
Devices Used to Access Noor System	The preliminary interviews
Nationality	The literature & The preliminary interviews
The Duration of Filling the Questionnaire	Retrieved from the online survey website
Teachers' and Parents'	
Children	The preliminary interviews
Children Educational Level	The literature & The preliminary interviews
Use Noor System for Monitoring Children Academic Progress	The preliminary interviews
Frequency of Using Noor System to Monitor Children Academic Progress	The preliminary interviews
Job Experience	The preliminary interviews
Monthly Income	The literature & The preliminary interviews
Education Level	The literature & The preliminary interviews
Job Region	The preliminary interviews
Job Location	The preliminary interviews
Internet Access at Work	The literature & The preliminary interviews
Teachers'	

Teaching Level	The preliminary interviews
Weekly Teaching Lessons	The preliminary interviews
Students' Number	The preliminary interviews
Do other Tasks	The preliminary interviews
Parents'	
Job	The literature & The preliminary interviews
Use Noor System in their Job	The preliminary interviews
Students'	
Class Level	The literature & The preliminary interviews
Study Major	The preliminary interviews

4.9. The Distribution of the Questionnaires

In the current study, two methodological approaches were considered for distributing the questionnaires to the respondents: (1) the web-based survey solution using Smart Survey, and (2) the distribution of physical questionnaires to respondents with the help of MOE staff.

Smart Survey (www.smartsurvey.co.uk) is a provider of web-based survey solutions, which distributes online questionnaires to a selected sample group. It was selected for the current study, and the hyperlink for the survey questionnaire was distributed via email to the entire sample by MOE administrative staff. Smart Survey has several advantages over the physical distribution of questionnaires, as reported by Smart Survey (2014): (1) it is able to handle large numbers of participants, and allows a questionnaire to reach a large group of users quickly; (2) it is easily integrated with Microsoft Excel, through which all of the data collected can be imported into Statistical Package for the Social Sciences (SPSS) software for analysis; (3) its integration with SPSS eliminates data entry errors that are likely to occur if data is transferred manually from a paper questionnaire into SPSS. Nevertheless, Smart Survey also possesses certain disadvantages: (1) it is expensive to use, as the rates depend on the number of respondents chosen to participate in a survey; and (2) it requires that all of the selected respondents have an email address for the receipt of the link to the questionnaire.

The second data collection method that was considered for this current study was the distribution of physical questionnaires to the respondents, with the help of MOE staff. However, it was decided that this option would only be considered if the Smart Survey online method failed.

Since the current Noor system study was conducted in collaboration with the MOE in the KSA, following the translation of the questionnaires, they were reviewed for all possible anomalies, then passed to the director of the Noor system, based in Riyadh. Upon reviewing them, the questionnaires were deemed to be suitable for the purposes of the study, and were subsequently approved, and permission was granted to conduct the study. A survey link was created on Smart Survey, and it was emailed to the Noor director, then an official at the MOE at the Noor headquarters in the city of Riyadh was instructed to email the survey link to the registered users with an email account with the Noor system.

4.10. Data Screening

The online data collected was imported to Excel, and thoroughly screened in order to assess whether the data met the required statistical assumptions. In the final stage, the data was uploaded into SPSS version 22 for further screening, using descriptive statistics. At this stage, the normality test was crucial, as it guides a researcher on the appropriate statistical estimates that can be employed for estimating the standardised estimates. The maximum likelihood estimate (MLE) is the method most researchers prefer, especially when the data has met the required normality assumptions. However, in case of the non-normality of the data, an asymptotically distribution free estimate (ADF) is preferred.

The overall initial sample size for the current study was N = 10,711 respondents, and the original data file was comprised of 1,655 teachers (15.5%), 3,666 students (34.2%), and 5,390 parents (50.3%). The main data was assessed for outliers that might compromise the normality of the data, and was assessed for any missing data. The data was found to be abnormal to some extent, as discussed in detail in section 4.10.3. The sample collected was not found to be missing any data, and thus the data was deemed fit for further preliminary statistical investigations. However, although the items included under Objective Usability had factor loadings above 0.60, they were removed from the final model, because it was difficult to measure Objective Usability without performing an actual experimental usability of the Noor system on the intended participants.

4.10.1. Outliers

Tabachnick and Fidell (2013, p. 106) defined an outlier as "*a case with such an extreme value on one variable (a Univariate outlier) or such a strange combination of score on two or more variables (multivariate outlier) that distorts statistics*". The current study employed the seven-point Likert scale, and the 10-point Guttman scale, and thus, there were no outliers reported. Therefore, it was concluded that the strict use of these two scales did not allow the respondents in the three groups under investigation to indicate responses beyond these scales. Likewise, the questions in the questionnaires, especially the socio-demographics, were designed in such a manner that a respondent could only proceed to the next question by responding to the previous question.

4.10.2. Handling Missing Data

The data collected was investigated for missing data. However, after running the preliminary frequency analysis, no missing data were found. Thus, the data was approved as not possessing any missing data.

4.10.3. Normality Test

The normality test for the study sample (N = 10,711) was investigated by employing the skewness and the kurtosis among the individual items that remained in the model, which produced acceptable factor loadings, as shown in the model in Table 5.1 on page 147. Trochim and Donnelly (2006); Field (2009); Gravetter and Wallnau (2014) suggested that the acceptable range for both skewness and the kurtosis should be ±2. Upon evaluating the individual values of each item in the current study, it was noted that none possessed a value beyond the ±2 limit, therefore the data did not have major problems with either skewness or the kurtosis. Hair et al. (2014, p. 573) stated that in order to avoid the problem of deviation from normality, 15 respondents should be assigned to each parameter being estimated in the model.

The adequacy of the sample size was determined in order to ensure that the data was adequate for SEM. The normality of the data was assessed to determine whether the three samples of the data, in terms of the teachers' data, the students' data, and the parents' data, were fit for SEM analysis. The survey instrument employed in the study included 55 items. Khine (2013) recommended that in order to select the correct sample size in a SEM study, each parameter should be estimated by 10 participants if the data is normal, and the ratio for the number of participants should be increased to 15 if the data is non-normal. Therefore, if the data was normally distributed in the current study, a minimum sample size of 55 X 10 = 550 participants, would be required per group (the teachers, the students, and the parents), based on SEM. However, if the data was non-normal, the minimum sample size would be 55 X 15 = 825 participants per group (the teachers', the students', and the parents'), based on SEM.

4.10.3.1. Joint Multivariate Kurtosis

The study conducted by Tabachnick and Fidell (2013, p. 108) defined Mahalanobis as "*the distance of a case from the centroid of the remaining cases, where the centroid is the point created at the intersection of the means of all the variables*". The authors further stated that "*under some conditions, Mahalanobis distance can either 'mask' a real outlier producing a false negative or 'swamp' a normal case producing a false positive*", thus not making the test a reliable indicator for multivariate outliers. This should therefore be used with caution.

A joint multivariate Kurtosis was performed to investigate whether the final data had any severe non-normality issues, and the Mahalanobis test was performed severally, together with the deletion of some Mahalanobis outliers with significant *p* values. However, due to the large sample size, the Mardia's coefficient (the multivariate Kurtosis) was still inflated, as the Kurtosis was 937.19; Cr = 656.21, suggesting that the items measured were not distributed normally. In this scenario, all of the 10,711 respondents were considered eligible for further data analysis, without the deletion of the respondents from the original data.

4.10.3.2. Multicollinearity Test

A multicollinearity test was determined by use of the tolerance and the variance inflation factor. Hair et al. (2014, p. 197) defined tolerance as *"the amount of variability of the selected independent variable not explained by the other independent variables"*, while they described the variance inflation factor as the *"inverse of the tolerance value",* that is, the degree by which the standard error has been increased, due to the presence of multicollinearity in the independent variables. The authors further stated that when the effect of multicollinearity increases, the parameter estimation, that is, the total variance explained in the model, decreases. Hair et al. (2011) stated that the variance inflation factor value should be less than 5. However, Spss (2015) suggested that when the variance inflation factor values range from 1-10, it shows no multicollinearity, although values of <1 and >10 are indicative of multicollinearity. A multicollinearity test was conducted using the composite standardised z scores of the constructs by using a linear regression in SPSS version 22. The construct Use Behaviour was used as the dependent variable, while the other constructs were employed as the independent variables. The model was not found to be suffering from major issues of multicollinearity. The findings are presented in Table 4.4.

Table 4.4: Multicollinearity test

Coefficients (a)	Collinearity Statistics	
Constructs	*Tolerance*	*VIF*
PU	0.259	3.855
SN	0.286	3.492
IMG	0.464	2.156
REL	0.318	3.145
RES	0.415	2.411
PEC	0.156	6.416
PEOU	0.284	3.517
ENJ	0.187	5.348
BI	0.416	2.411
CSE	0.739	1.353
CANX	0.836	1.196
CPLAY	0.692	1.445
OU	0.172	5.806

Notes: (a) Dependent Variable: Use Behaviour, VIF = Variance Inflation Factor. VIF values range from 1-10, shows no multicollinearity, while values <1 and >10 are indicative of multicollinearity.

4.10.4. Descriptive and Preliminary Statistics

Preliminary statistics were conducted to investigate the frequencies and the pattern of the data collected. The data was presented in tables, comparing the three groups under investigation. Table 4.5 illustrates the respondents in the two system settings.

Table 4.5: The System Usage Setting

Group	System setting	Frequency	Percent
Teachers	Compulsory	1655	100
Students	Voluntary	3666	100
Parents	Voluntary	5390	100

Notes: The participants were asked to state on the questionnaires how they view the Noor system in terms of usage settings.

Regarding experience of using the Noor system among the teachers, those with more than four years' experience represented the highest percentage (40%), while those with fewer than six months' experience represented the lowest percentage (6%). This demonstrated that the teachers' data was skewed to the right. However, the data for the students appeared to be normally distributed, with students possessing two to three years' experience forming the majority (22%), while those with six to 12 months' experience represented the minority (11%). Meanwhile, the parents with between one and two years' experience represented the majority (22%), while those with between six and 12 months' experience were the minority (10%). See V84 in Appendix H.

The age of the teachers was negatively skewed, with those in the 35 to 45 age bracket representing the majority (41%), while those aged above 55 years represented the minority (1.7%). The age of the students was positively skewed, with those aged between 18 and 25 years representing the majority (36%), while those who below 15 years of age were the minority (7%). Meanwhile, the majority of the parents (53%) were aged between 35 and 45 years, with a minority (3%) aged over 55 years old. See V63 in Appendix H.

The findings concerning gender showed that males were in the majority in all three groups, compared with females. This is not unusual in the KSA, where cultural influence is very strong. In total, 84% of the teachers were male, 75% of the students, and 87% of the parents. See V64 in Appendix H.

Since the main purpose of the Noor system is to monitor the academic progress of children, only the teachers and the parents were asked the next question, the findings of which revealed that the teachers who had no children were the majority users of the system (42%), compared with those who had children (37%). Meanwhile, 22% of the teachers acknowledged that they had children, but did not use the Noor system to monitor their academic progress. In terms of the parents, 68% acknowledged that they used the Noor system. This study was unable to establish the reasons why individuals choose not to use the Noor system, and it was therefore concluded at this juncture that there is an urgent need to investigate why some teachers and parents do not use the Noor system, especially since it was adopted nationally in the KSA in 2010. See V69 in Appendix H.

Regarding the level of education, 82% of the teachers possessed a bachelor's degree, which represented the majority, while 0.2% had attained only the primary level of education. These statistics suggested that most teachers in the KSA are well educated. Furthermore, the majority of the parents (42%) had attained at least a master's degree, although a small number (0.1%) had no formal education. See V79 in Appendix H.

The availability of internet access at work was believed to possess an influence on the use of the Noor system, since the findings revealed that 72% of the teachers acknowledged that they have internet facilities in their offices, while 28% had no internet access. Meanwhile, 82% of the parents acknowledged that they had internet access at their workplace, and 10% did not. The fact that a lack of internet access may have an impact on the use of the Noor system was deemed appropriate for investigation in Chapter Six, under the section concerning moderation testing. See V90 on Appendix H.

The validity of the data collected was investigated prior to performing the data analysis, in order to establish the relationship between the model and the items investigated. The preliminary statistics are essential in any research, since they provide a guide for the researcher in terms of the basic pattern of the data collected.

Hair et al. (2014) stated that either covariances or correlations can be used in estimating SEM, and that the sample size and missing data can have a significant impact on the findings, regardless of the analytical process adopted. The items in the questionnaire involved in the current study were developed using a seven-point Likert scale, and thus, the entire dataset was constituted of non-metric data, since the data was binary, ordinal, or nominal. Hair et al. (2014) suggested that in a case in which the missing data has a non-random pattern, or in which more than 10% of the data is missing, there are four basic remedies: listwise deletion, pairwise deletion, imputation, and model-based approaches, one of which must be performed in order to overcome the problem associated with a missing data matrix, as any conclusion drawn from the missing data would be suspicious. Since there was no missing data in the current study, it was not necessary to adopt any of these remedies.

Hair et al. (2014) also stated that an adequate sample size allows for the sampling error to be minimised when using non-normal data. The multigroup analysis approach requires that the sample size in a comparative moderation group is greater than 100, since it would not be possible to proceed with the moderation testing in SPSS AMOS with a small sample size. In this current study, the sample size was massive, and it therefore reduced the sampling error, and allowed further analysis using SEM, and especially multigroup analysis.

4.10.5. Composite Reliability Testing (CR)

It was suggested by Carmines and Zeller (1979) that the strength of the construct relationship (reliability) should be determined prior to the main data analysis, in order to establish the extent to which a repeated trial would produce similar findings. Tabachnick and Fidell (2013) described reliability as the proportion of true variance, relative to total variance, where both are assessed through squared multiple correlation (SMC), such that the dependent variable is the measured variable, and the independent variable is the factor (predictor) variable.

The Cronbach's coefficient alpha, and the item-to total correlation are usually employed to determine the reliability of the data. Cronbach's coefficient alpha assesses the consistency of the data by measuring the inter-item consistency among the participants' responses. Harby et al. (2010) suggested that the items to be measured should be correlated with each other in the model if they are independent measures. Therefore, for the current study, the Cronbach's reliability alpha was employed to estimate the reliability of the constructs, while the squared factor loadings were used to investigate the individual items in terms of their reliability. The analysis was performed using the scale reliability function in SPSS. The standardised regression weights, that is, the factor loadings, were obtained after running the full data on the path diagram for the model that was drawn on AMOS. The squared factor loadings were computed manually by squaring the standardised regression weights. The Cronbach's reliability alpha values were computed by determining the scale reliability in SPSS. Meanwhile, the composite reliabilities were computed using the composite reliability calculator developed by Colwell (2016). The decision of whether to retain or remove any of the 55 items is shown in Appendix M Table 11.70.

All of the items that failed to pass the test for the standardised regression weight, and the squared factor loadings, were deleted from the model. In so doing, 10 items were removed from the original model, leaving the final model with 45 items. See Appendix M Table 11.71 for the revised items, and the constructs that were retained in the final model.

The final model was found to be a fit in terms of reliability testing.

4.10.6. Construct Validity

The type of data obtained determines the way in which specific data can be validated. Construct validity, content validity, criterion validity, and discriminant validity are some of the measures that can be employed to investigate the validity of the data collected. The most popular of these measures are construct validity and discriminant validity, which is evaluated by extracting the average variance. Selim (2003) suggested that the square root of the average variance extracted (AVE) for each construct must be greater than the correlation values between that particular construct and all the other constructs in the data under investigation.

Although the final model to be employed for this current study passed the Cronbach's alpha and the composite reliability tests, it was necessary to conduct the construct validity by first assessing the unidimensional aspect of the constructs. Hair et al. (2014, p. 606) stated that *"Unidimensional means that a set of measured variables (items) can be explained by only one underlying* *construct, and it becomes critically important when more than two constructs are involved"*.

The construct validity was investigated using both the convergent validity testing, which examines the AVE, and the divergent validity, which examines the validity of the data by assessing the items with the correlations that are likely to overlap in the constructs. The final model retained its 14 constructs, and thus, it was necessary to measure unidimensionality , since Hair et al. (2014, p. 606) stated that "*one type of relationship among variables that impacts unidimensionality is when researchers allow a single measured variable to be caused by more than one construct*".

4.10.6.1. Convergent Validity Testing

The AVE is the average amount of variation "*that a latent construct is able to explain in the observed variables to which it is theoretically related*" Farrell (2010, p. 324). Hair et al. (2014, p. 632) explained that for a model to undergo the AVE convergent validity test, the recommended value for each construct in the model should surpass the minimum recommended value of 0.5. In the current study, the AVE and the Jöreskog rho estimates were computed using the SEM stats Excel macro developed by Korchia (2010). The AVE estimates shown on Table 4.6 demonstrate that the resulting AVE values ranged between 56.8% and 90.4%. Similarly, the values of Jöreskog rho ranged between 79.7% and 95.9%. Thus, the constructs in the Noor system model were found to pass the convergent validity test.

Table 4.6: Average Variance Extracted (AVE), and Construct Reliability (CR) of the 14 constructs in the final model.

Variable Recommended value	Abbreviation	Average Variance Extracted Rho vc >.5	Construct reliability Jöreskog rho >.5
Perceived Usefulness	PU	0.745	0.946
Perceived Ease of Use	PEOU	0.710	0.907
Behavioural Intention	BI	0.678	0.862
Use Behaviour	USE	0.615	0.827
Perceived Enjoyment	ENJ	0.886	0.959
Computer Playfulness	CPLAY	0.698	0.815
Objective Usability	OU	0.805	0.892
Computer Anxiety	CANX	0.783	0.915
Perceptions of External Control	PEC	0.737	0.943
Computer Self-Efficacy	CSE	0.568	0.797
Results Demonstrability	RES	0.771	0.910
Job Relevance	REL	0.865	0.951
Image	IMG	0.718	0.884
Subjective Norm	SN	0.904	0.950

4.10.6.2. Divergent Validity Testing

In the current study, the 14 constructs were examined using the various items shown in Table 4.8. All of the constructs were measured using a seven-point Likert scale, apart from Computer Self-Efficacy, which was measured using a 10-point Guttman scale. Thus, to conduct a discriminant validity test, it was vital to determine the standardised composite z scores for all of the constructs in the final model. The standardised z scores mean that all the items on the constructs were constrained to a mean of zero, and a standard deviation of one, that is, (m = 0; sd = 1). The z scores were then computed into composite z scores that represented their respective constructs in the model. Finally, Pearson's correlation analysis was run using SPSS version 22, and the values were entered in Table 4.7 for comparative purposes with the AVE.

As recommended by Fornell and Larcker (1981); Hair et al. (2014), the final model demonstrated good discriminant validity, as the square roots of the AVEs were greater than 0.5. Farrell (2010, p. 325) stated that a lack of discriminant validity produces uncertainty in terms of whether a set of confirmed hypothesised findings on the structural paths are real, or are due to statistical discrepancies. The discriminant values are highlighted in bold on Table 4.7.

Table 4.7: Discriminant Validity Test.

Constructs	AVE	PU	SN	IMG	REL	RES	PEC	PEOU	ENJ	BI	CSE
PU	0.745	**0.863**									
SN	0.904	0.678	**0.951**								
IMG	0.718	0.585	0.621	**0.847**							
REL	0.865	0.749	0.639	0.615	**0.93**						
RES	0.771	0.643	0.639	0.548	0.683	**0.878**					
PEC	0.737	0.845	0.73	0.608	0.751	0.725	**0.859**				
PEOU	0.710	0.698	0.609	0.485	0.608	0.713	0.825	**0.843**			
ENJ	0.886	0.756	0.741	0.65	0.688	0.701	0.848	0.762	**0.941**		
BI	0.678	0.611	0.596	0.521	0.673	0.68	0.667	0.583	0.632	**0.83**	
CSE	0.568	0.289	0.287	0.221	0.323	0.375	0.34	0.326	0.295	0.41	**0.754**
		-			-	-	-			-	
CANX	0.783	0.162	-0.207	-0.28	0.125	0.102	0.151	-0.088	-0.18	0.057	0.84
CPLAY	0.698	0.308	0.328	0.32	0.355	0.393	0.369	0.332	0.347	0.418	0.351
OU	0.805	0.749	0.757	0.62	0.689	0.737	0.849	0.774	0.867	0.623	0.303
USE	0.615	0.529	0.538	0.507	0.526	0.636	0.642	0.633	0.638	0.558	0.278

Once the model was validated, and the reliability of the data investigated, the final analysis of the data collected commenced. While SEM was the main analytical method employed, the descriptive statistics were performed using SPSS. Therefore, SPSS and AMOS, which is an add-on module for SPSS, were the main analytical tools employed for this study. IBM SPSS AMOS employs the general approach to data analysis known as SEM, which is also known as the analysis of covariance structures (ANCOVA), or causal modelling. Arbuckle (2014) stated that AMOS adopts a general approach to data analysis, namely SEM, analysis of covariance-based structures, causal modelling, and well established conventional techniques, such as the general linear model, and the common factor analysis.

AMOS allows the testing of the hypothesised or conceptual models under investigation by drawing the relationships between construct(s) and construct, or between constructs and items, using a graphical interphase known as a path diagram. One of the main advantages of AMOS is that it allows the import of data from several sources, such as SPSS databases and the popularly used MS Excel spreadsheets. According to UTEXAS (2010), although AMOS is mainly used for SEM, covariance based structural modelling, and path analysis can also be employed for ANCOVA, analysis of variance (ANOVA), and linear regression analysis. The use of a SEM allows the theoretical model to be tested against empirical data, and provides a platform that tests the theoretical model against the empirical data collected. In the current study, TAM 3 was the theoretical model under investigation.

4.11. SEM

In this section, the foundation of SEM guidelines for analysing the covariance structure of variables is briefly described, namely the model specification, the model identification, the model estimation, the model evaluation, and the model modification. The theoretical model should be either confirmed or disconfirmed, depending on the model-fit criterion that is also discussed in this section. Several different models were created and investigated, in order to determine which model would best fit the data collected. The Chi-square difference test was applied in order to compare the fit of the models. In most cases, the theoretical models do not fit the acceptable model–fit criterion, and thus the model are deemed unfit.

SEM is a technique based on multiple regression and factor analysis that allows models of relationships to be tested in order to assess how well the models fit the data. It is built upon multiple regression and factor analysis techniques that investigate the model's goodness-of-fit (GOF), and tests the hypothesised relationships in the models. Thus, Cohen et al. (2011) suggested that SEM models are causal, and are defined by researchers to confirm, modify, and test causal relationships between the variables under investigation.

It was suggested by Lomax and Schumacker (2010) that in a case in which the model is unfit, the modification indices should be used to add paths to the model, based on the existing empirical literature, and that non-significant paths should be deleted from the model in order to obtain the final best model that would fit the data well statistically, with practical and substantive theoretical meaning. The combination of methodological advances and the improvements made to numerous and different aspects of software in SEM has engendered its popularity among researchers, and has allowed its application in different research fields worldwide (Khine (2013). Furthermore, Lomax and Schumacker (2010) stated that SEM utilises different models to investigate the hypothesised relationships between observed variables with the aim of defining and testing the theoretical constructs in the hypothesised model.

SEM employs a hypothesis testing approach, and uses the two main procedures of investigating the causal and the structural relationships by conceptualising the theory under investigation (Byrne (2010). According to Byrne (2010), the hypothesised model is tested statistically to determine the consistency of the data. If the model passes the GOF test, then it is accepted. If the GOF is inadequate, the model and its relations are rejected.

Byrne (2010) also explained that SEM can be applied effectively in research areas that involve non-experimental research, while Cohen et al. (2011)

described SEM as a powerful tool that uses intervals and ratio data in statistically-based research, and can be performed using the AMOS software package that is able to import and work with SPSS database files. According to Pallant (2013), SEM utilises multiple regression and factor analytic techniques that allow the evaluation and testing of the overall model fit of the data using AMOS.

Blunch (2012) explained that SEM is used for verifying proposed theories by mapping the theory of the system under investigation, and then applying SEM to test the empirical data. According to Lomax and Schumacker (2010), SEM is popular because firstly, researchers are becoming better informed about using multiple observed variables in their studies, and are therefore employing modelling and statistical testing of complex datasets; secondly because the validity and reliability scores of SEM measurements are considered in the analysis by taking into account the measurement error; thirdly because of its ability to analyse increasingly advanced theoretical SEM models over the past 30 years; and fourthly because of the increased user friendliness of SEM software programmes.

According to Blunch (2012), the benefit of using latent variables in SEM is that concepts are diffuse and are not measurable directly, therefore there is a need to measure them indirectly as indicators (items) in the questionnaire format, unlike in other science disciplines that have measurable units, such as weight, length, and height. Kline (2015) explained that SEM is a family of related procedures, and is not designated to be a single statistical technique, as it also includes a covariance structure analysis, and covariance structure modelling.

According to Tabachnick and Fidell (2013), a model is identified when a unique numerical solution exists in the model for each of its parameters, and it is advised that only models that are identified should be investigated and estimated. Multigroup modelling is also necessary in SEM, and Tabachnick and Fidell (2013) noted that SEM can be used to estimate and compare models from more than two samples, that is, multiple group models, by assuming that the general null hypotheses investigated represents data from the same population.

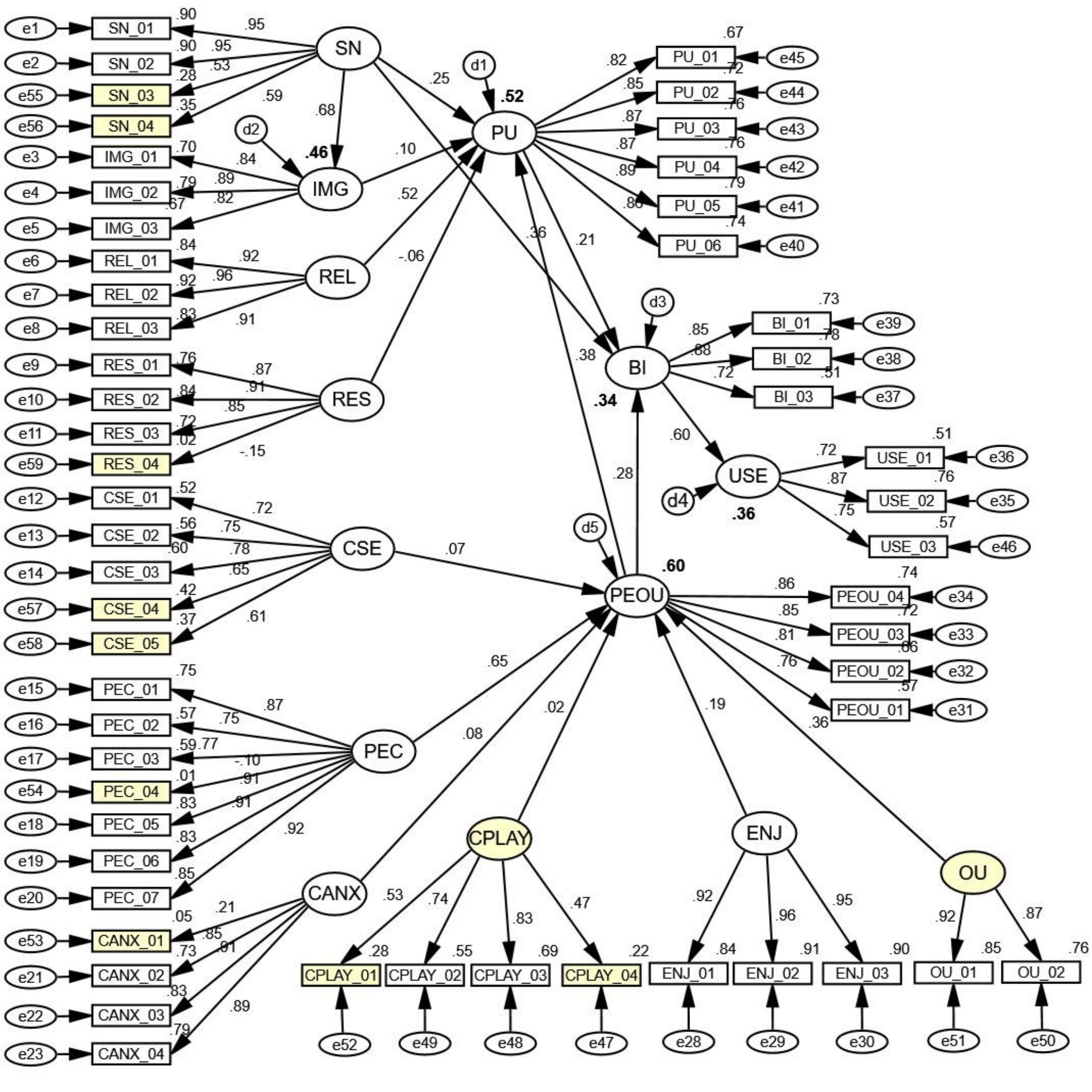
According to Kline (2015), standard errors in large effects of latent variables are inaccurate in a small sample size, but SEM is a large-sample technique. He also explained that SEM requires a large sample size when (1) the SEM model is complex, with many parameters to be estimated; (2) when the outcomes are non-continuous, with a severely non-normal distribution, or when the data has curvilinear or interactive effects; (3) when the reliability score is low, in order to offset the possible effects of measurement error; and (4) when factor analysis has been selected as the main analytical approach, in order to explain the unequal proportions of variance across the items under investigation. Thus, Kline (2015) suggested that a sample size of 200 would be too small when analysing complex models, or when the data includes outcomes that have non-normal distributions, especially when a MLE method is not used, and some of the data is missing.

According to Mancha and Leung (2010), the SEM technique enables the testing of theoretical propositions by the use of non-experimental data engendering valid conclusions if the theoretical rationale is consistent, thereby confirming it as a confirmatory, rather than an exploratory technique.

In the current study, SEM was employed to test all of the hypothesised relationships in the model, and multiple group was performed to investigate the moderation effects, since it is "*made up of a measurement model and a structural model*" (Khine, 2013, p. 6), and Hair et al. (2014, p. 565) stated that "*Structural Equation Modelling is a conceptually an appealing way to test theory in terms of relationships among measured variables and latent constructs (variates)*".

In this study, the individual constructs in the model were identified and defined. TAM 3 was plotted in AMOS, and path analysis was applied to the model. Path analysis is an extension of multiple regression, and was used to test the magnitude and the significance of the hypothesised causal relationships to enable an observation of the relative weightings of the independent variables on one other, since Cohen et al. (2011) suggested that the relative weightings reveal the direct and indirect effects of the defined independent variables on the dependent variables. The items identified in the questionnaires were assigned to the latent constructs (determinants) using the path diagram, and their relationships were plotted (see Figure 4-1). In the path diagram, three types of relationships were plotted, namely: (i) measurement relationships between items and constructs; (ii) structural relationships between constructs; and (iii) correlational relationships between constructs, with regard to the error terms of the items (Hair et al., 2014, p. 568).

Figure 4-1: The path diagram with all the constructs before the deletion of some items



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

The determinants in the model were divided into three categories, namely, the general determinants of Perceived Usefulness, the anchors, and the adjustments. The determinants of Perceived Usefulness were Subjective Norm, Image, Job Relevance, Output Quality, and Results Demonstrability. The anchors included Computer Self-Efficacy, Perceptions of External Control, Computer Anxiety, and Computer Playfulness. The adjustments included in the model were Perceived Enjoyment, and Objective Usability, while the anchors and the adjustments were the general determinants of Perceived Ease of Use. The scales from extant published academic research regarding TAM 3 were employed to design the items in the study. Hair et al. (2014) suggested that a new scale can be used to develop the items that do not have a rich history of previous research, and recommended that items "*that do not behave statistically as expected may need to be refined or deleted*" in order to screen the items for appropriateness when analysing the final model Hair et al. (2014, p. 567).

The structural model was applied by converting the measurement model into a structural model. Single-headed directional arrows were employed to specify the structural model through plotting relationship arrows from one construct to the other by use of the theoretical model proposed in the theoretical background, and hypotheses testing. Therefore, each hypothesis was represented using a specific relationship, as outlined in the proposed TAM 3. Similarly, the moderation relationships were tested as indicated in TAM 3, together with new moderators.

4.11.1. Measurement Model Assessment

The data for the 10,711 respondents was tested for critical reliability, convergent validity, divergent validity, and the overall model fit using all of the 55 items measured in the current study. By running the overall model, the factor loadings for each item were determined, which helped in the assessment of the reliability, and the validity of the individual items. The original model of the current study included 14 main constructs, and 55 items. The summary of the constructs and their items is illustrated in Table 4.8.

Table 4.8: Variables and the number of items measured in the TAM 3

Variable	Abbreviation	Number of measured items
Perceived Usefulness	PU	6
Perceived Ease of Use	PEOU	4
Behavioural Intention	BI	3
Use Behaviour	USE	3
Perceived Enjoyment	ENJ	3
Computer Playfulness	CPLAY	4
Objective Usability	OU	2
Computer Anxiety	CANX	4
Perceptions of External Control	PEC	7
Computer Self-Efficacy	CSE	5
Results Demonstrability	RES	4
Job Relevance	REL	3
Image	IMG	3
Subjective Norm	SN	4
Total	**14 constructs**	**55 items**

The reliability of the constructs and the items were investigated using composite reliability testing and construct validity. The data was assessed for any missing data by conducting a frequency test as the preliminary statistic, using SPSS. The summary statistics can prove useful, as they guide a researcher in comprehending the distribution of the responses, and the distribution pattern for each specific question.

4.11.2. Overall Measurement Model Fit

The fit indices using the full data set N = 10,711 are presented in Table 4.9. However, the model only provided results for the full model, and when this was tested using the three groups of teachers, students, and parents, one item under Computer Playfulness-02 was found to have a negative error variance, which made the SEM solution inadmissible. When the model was re-run on Computer Playfulness-03, using only one item, no SEM results were generated. This prompted the complete removal of the Computer Playfulness items from the final model. Similarly, although Objective Usability had very good factor loadings on its two items of Objective Usability-01, and Objective Usability_02, they were removed from the final model because of the means by which they were tested in the study. Previous researchers have claimed that Objective Usability is better investigated in an experimental setting Venkatesh and Bala

(2008), and in support of this, Al-Gahtani (2016) did not measure Objective Usability in his TAM 3 study. Upon the deletion of the two constructs of Computer Playfulness and Objective Usability from current the model, the final model improved, and was left with 12 constructs (see Table 4.10).

Hair et al. (2014) suggested that a minimum sample size of 500 is required for models with a large number of constructs, especially when some constructs are measured using fewer than three items. Therefore, in the final model, Subjective Norm was estimated using two items, while Use Behaviour was estimated using three items. Two items were removed from Subjective Norm because their squared factor loadings were less than .50, and failed both the discriminant and validity tests.

During the creation of the measurement model, extant empirical literature was used to establish the theoretical basis of the constructs, and it was ensured that each construct had a minimum of three items, in order that the SEM model could run without any problems. The measurement structural model (path diagram) was plotted in SPSS AMOS. Each of the following constructs was measured using specific item questions developed using the seven-point Likert scale: Perceived Usefulness (6 items), Perceived Ease of Use (4 items), Perceptions of External Control (7 items), Perceived Enjoyment (3 items), Objective Usability (2 items), Subjective Norm (4 items), Image (3 items), Job Relevance (3 items), Results Demonstrability (4 items), Use Behaviour (3 items), Behavioural Intention (3 items), Computer Playfulness (4 items), and Computer Anxiety (4 items), while a 10-point Guttman scale was employed for Computer Self-Efficacy (5 items). In total, the structural path diagram was constituted of 55 items. However, the two moderators of Voluntariness and Output Quality possessed 3 items each, whereas Experience was measured using a categorical scale.

It was suggested by Lomax and Schumacker (2010) that the three criteria for judging the statistical significance and substantive meaning of a theoretical model are: (1) The use of non-statistical significance ($p > .05$ is acceptable) of the Chi-square test, and the Root Mean Square Error of Approximation

(RMSEA) ($p < .05$ is acceptable); (2) The assessment the statistical significance (t value) of the parameter estimate at .05 confidence level; and (3) The assessment of the magnitude and the direction of the parameter estimate (negative or positive signage).

According to Hoyle (2012), the standardised root mean square residual (SRMR), the RMSEA, the Tucker-Lewis index (TLI), and the Comparative Fit Index (CFI) are the most widely accepted global GOF indices, while Hu and Bentler (1999) suggested that the acceptable model fit should have an SRMR $\leq .08$, RMSEA $\leq .06$, and a CFI and TLI of $\geq .95$.

The GOF and the construct validity of the current measurement model were assessed. The GOF supports a model as a true representation of the data collected by showing no differences between data matrices. Khine (2013, p. 14) stated that GOF "*assess[es] the relative amount of the observed variances and covariances explained by the model*", and is "*analogous to the R^2 in regression analysis*", while Hair et al. (2014, p. 576) stated that "*the Goodness-of-Fit (GOF) indicates how well the specified model approaches the observed covariance matrix among the indicator items*".

The Chi-square (x^2) statistical measure was assessed first, as it quantifies the differences between covariance matrices. However, there can be a possibility of rejecting a better fit model as a misfit, especially when the p value obtained from the Chi-square (x^2) statistical measure is less than 0.05. In the good model fit metric (CMIN/DF) suggested by Wheaton et al. (1977), the relative/normed should not exceed five for models with a good fit. Meanwhile, Tabachnick and Fidell (2013) recommended that the acceptable ratio should be below two. However, SEM differs from other multivariate tests when the Chi-square (x^2) statistical measure is less than the p-value of 0.05. Hair et al. (2014) explained that when the two statistical covariance matrices are different, they prove certain problems with the model fit, thus the recommended value for Chi-square (x^2) should be small, but with a larger p value.

The relative fit indices in the final model were investigated, namely the GOF index (GFI), the adjusted GOF index (AGFI), the CFI, the incremental fit index (IFI), the normed fit index (NFI), and the Tucker-Lewis fit index (TLI). Wheaton et al. (1977); Bentler and Bonnet (1980) recommended that these relative fit indices should be above the level of 0.90, while Hooper et al. (2008) recommended that the relative fit indices should be above 0.95, and Hair et al. (2014, p. 589) suggested that

> *multiple fit indices should be used to assess a model's goodness-of-fit and should include: the x^2 value and its degree of freedom, one absolute fit index (i.e., GFI, RMSEA, or SRMR), one incremental fit index (i.e., CFI or TLI), one goodness-of-fit (GFI, CFI, TLI), and one badness-of-fit index (RMSEA, SRMR).*

Furthermore, Hair et al. (2014, p. 579) stated that the RMSEA "*attempts to correct for the tendency of x^2 GOF test statistic to reject models with a large sample of a large number of observed variables*". Meanwhile, MacCallum et al. (1996) suggested that the RMSEA should be below the value of 0.08. Similarly, Steiger (2007) suggest that the RMSEA Value should be below an upper limit of 0.07. In addition, Khine (2013) suggested that the RMSEA value should be less than 0.05, and that its value should be reported with a confidence level of 95%, in order to account for the sampling error associated with the estimated RMSEA value. Therefore, during the reporting of the RMSEA value, also the value of PCLOSE associated with the specific RMSEA should also be reported, in order that when the RMSEA value fits the above stated recommendations, its PCLOSE value should not be significant.

The Standardised Root Mean Residual (SRMR) helps to predict and identify any potential problems that might occur in the measurement model, and Hair et al. (2014) suggested lower SRMR values, as they are indicative of a better fit model, while a worse fit model would be indicated by higher SRMR value, above 0.1, while Khine (2013) stated that SRMR indicates the extent of error arising from the estimation of the model that has been specified.

Table 4.9: The MLE fit indices measures (model 1).

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Model 1	103.95	<.001	0.632	0.812	0.8	0.814	0.802	0.814	0.098	0.398

Notes: GFI = Goodness of Fit Index, NFI = Normed Fit Index, RFI = Relative Fit Index, IFI = Incremental Fit Index, TLI = Tucker Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Standard Error Approximation, SRMR = Standardised Root Mean Residual. Full Model: Chi square statistic = 76,241 Degrees of freedom = 846. Model 1 = Full model with all the 14 constructs.

Hence, the final model for the current study did not show an overall acceptable fit of an over identified model. Nevertheless, Hair et al. (2014, p. 70) stated that large sample sizes reduce the detrimental effect of non-normality, and that researchers can be less concerned about non-normal variables, and can assess homoscedasticity issues, describing homoscedasticity as "*when the variance of the error terms appears constant over a range of predictor variables*".

4.11.3. Model Improvement

SEM models can be improved either by use of modification indices to test the hypotheses, based on theoretical research, or by improving the model fit, based on an exploratory research. Ullman (2006, p. 46) stated that *"SEM is a confirmatory technique, and when model modification is done to improve fit, the analysis changes from confirmatory to exploratory"*. Therefore, no modification indices were employed to improve the fit of the final model, as the Noor study was a confirmatory study. However, the preliminary fit indices did not show acceptable values, as demonstrated in Table 4.10, which was attributed to the large sample size used in the study.

The chi square test is dependent on the sample size, Bentler and Bonnet (1980); Jöreskog and Sörbom (1993); Wang et al. (1996), and if it is not investigated properly, a better fit model might be rejected. Similarly, McIntosh (2006) suggested that the chi square test adopts multivariate normality, such that any severe deviancies are likely to engender the rejection of a properly specified model. Meanwhile, Hair et al. (2010) noted that the CMIN/DF inflates with large sample sizes possessing fewer constructs and items. The second model in the current study had a CMIN/DF value beyond the recommended value of .5, as suggested by Tabachnick and Fidell (2013), and was considered inflated due to the large sample size. Hair et al. (2010) stated that the cut-off point for relative fit indices for a model with a sample size of less than 200 should be strictly adopted, but in the case of a large sample size being investigated in a complex model with more than 30 items, this rule of thumb should be relaxed. In addition, Dawes et al. (1998) suggested that a GFI value of .80 in large sample size is acceptable, although they did not specify how large the sample size should be.

Table 4.10: The MLE fit indices measures (model 2).

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Model 2	92.20	<.001	0.704	0.846	0.835	0.847	0.837	0.847	0.092	0.379
Teachers’	14.91	<.001	0.696	0.832	0.821	0.842	0.831	0.842	0.092	0.364
Students’	31.32	<.001	0.704	0.839	0.828	0.843	0.833	0.843	0.091	0.374
Parents’	50.96	<.001	0.688	0.844	0.833	0.846	0.836	0.846	0.096	0.391

Notes: GFI = Goodness of Fit Index, NFI = Normed Fit Index, RFI = Relative Fit Index, IFI = Incremental Fit Index, TLI = Tucker Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Standard Error Approximation, SRMR = Standardised Root Mean Residual. Full Model: Chi square statistic = 76,241 Degrees of freedom = 846. Model 1 = Full model with all the 14 constructs. Model 2 = model without CPLAY and OU.

4.11.4. Comparative Fit Indices Measures for MLE and ADF Estimates

Wang et al. (1996) specified that sample size plays a notable role in SEM estimation, as large sample sizes have better parameter estimates compared with small sample sizes. Due to the non-normality of the data in the current study, both the MLE and the ADF estimate methods were compared. The model fit indices for the MLE estimate are shown in Table 4.9 and Table 4.10, while the fit indices for the ADF estimates are shown in Table 4.11.

Table 4.11: The ADF fit indices measures (final model).

Model	CMIN/DF	p	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Model 2	22.22	<.001	0.720	0.487	0.452	0.498	0.463	0.497	0.045	
Teachers'	10.60	<.001	0.725	0.488	0.453	0.512	0.477	0.511	0.076	.446
Students'	10.82	<.001	0.713	0.480	0.444	0.504	0.468	0.502	0.052	.471
Parents'	11.25	<.001	0.723	0.487	0.452	0.511	0.475	0.509	0.044	.494

Notes: GFI = Goodness of Fit Index, NFI = Normed Fit Index, RFI = Relative Fit Index, IFI = Incremental Fit Index, TLI = Tucker Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Standard Error Approximation. Model 2 = model without CPLAY and OU.

A closer comparison between the findings of MLE and ADF revealed that the MLE estimates compared better with the ADF estimates. The ADF solution for the teachers was inadmissible, because the error covariance on Subjective Norm_01 was negative. However, ADF produced far better CMIN/DF and RMSEA values than the MLE estimation. Curran et al. (1996) described Satorra-Bentler (SB) test statistics as an alternative to the MLE test statistics on non-normal data, and similarly, when compared to MLE and SB, the ADF test statistic might prove less powerful for testing the null hypothesis. Schermelleh-Engel et al. (2003) suggested that sample size matters when selecting an adequate estimation method, and that the rule of thumb found in the literature regarding the relative fit indices should not necessarily be adhered to, therefore MLE was adopted as the main estimation choice in the current study.

4.11.5. The Adjusted Fit Indices, the Bollen-Stine *p* Value, and RMSEA

The issues of the nonnormality of data is always problematic when SEM is adopted as the main analytical method, as they engender difficulty in conclusively generalising the hypothesis under investigation. In the current study, the univariate analysis indicated that the data was normal for both the kurtosis and the skewness. However, the data failed the multivariate analysis, as the Mardia's coefficient obtained from the data was greater than 10, which is the recommended value for data that does suffer from severe nonnormality. This meant that the data used in the current analysis failed the multivariate normality test. The Mardia's coefficient, and the chi square statistics are known to inflate with large sample sizes, therefore a special SPSS syntax programme developed by Walker and Smith (2016) was employed to compute the bootstrap-adjusted fit indices, that is, the CFI, the Tucker-Lewis index, the IFI, and the RMSEA. The syntax was used to adjust for nonnormality, the Bollen-Stine bootstrap-adjusted chi square statistic, and the Bollen scaling factor, by comparing both the independence, and the default models. Table 4.12 presents the chi statistic values for both the independence and the default models. The Bollen-Stine *p* value obtained from all four models tested in the current study was 0.01.

Table 4.12: The chi statistics in the model.

Models	*X2IM*	*X2DM*	*dfIM*	*dfDM*	*n*	*Bollen p*
Overall model	482520.902	74311.341	861	806	10711	0.01
Teachers’	71690.628	12019.111	861	806	1655	0.01
Students’	156950.597	25242.96	861	806	3666	0.01
Parents’	262745.483	41071.986	861	806	5390	0.01

Notes: X2IM = Chi statistics for the independence model, X2DM = Chi statistics for the default model, dfIM = degrees of freedom for the independence model, dfDM = degrees of freedom for the default model.

The adjusted fit indices shown in Table 11.69 in Appendix L indicated that, although the unadjusted fit indices had low values compared with their recommended values, the adjusted fit indices were all greater than the .96 recommended values, therefore the model employed in the analysis fitted the data well, and thus there were no concerns regarding the relative fit indices, and the issue of nonnormality of the data.

The overall model reported a Bollen-Stine scaling factor of 81 while the chi statistic for the default model was 37.7% greater than the Bollen-Stine chi statistic obtained. The teachers’ model had a Bollen-Stine scaling factor of 13, and its chi statistic for the default model was 16.2% greater than the Bollen-Stine chi statistic obtained. The students’ model had a Bollen-Stine scaling factor of 27, and its chi statistic for the default model was 64.3% greater than the Bollen-Stine chi statistic obtained, and finally, the parents’ model had a Bollen-Stine scaling factor of 44, and a chi statistic for the default model of 97.7% greater than the Bollen-Stine chi statistic obtained. These findings demonstrated that the syntax adopted in the current study was able to reduce the chi statistics for the default models to their acceptable values.

4.11.6. MLE

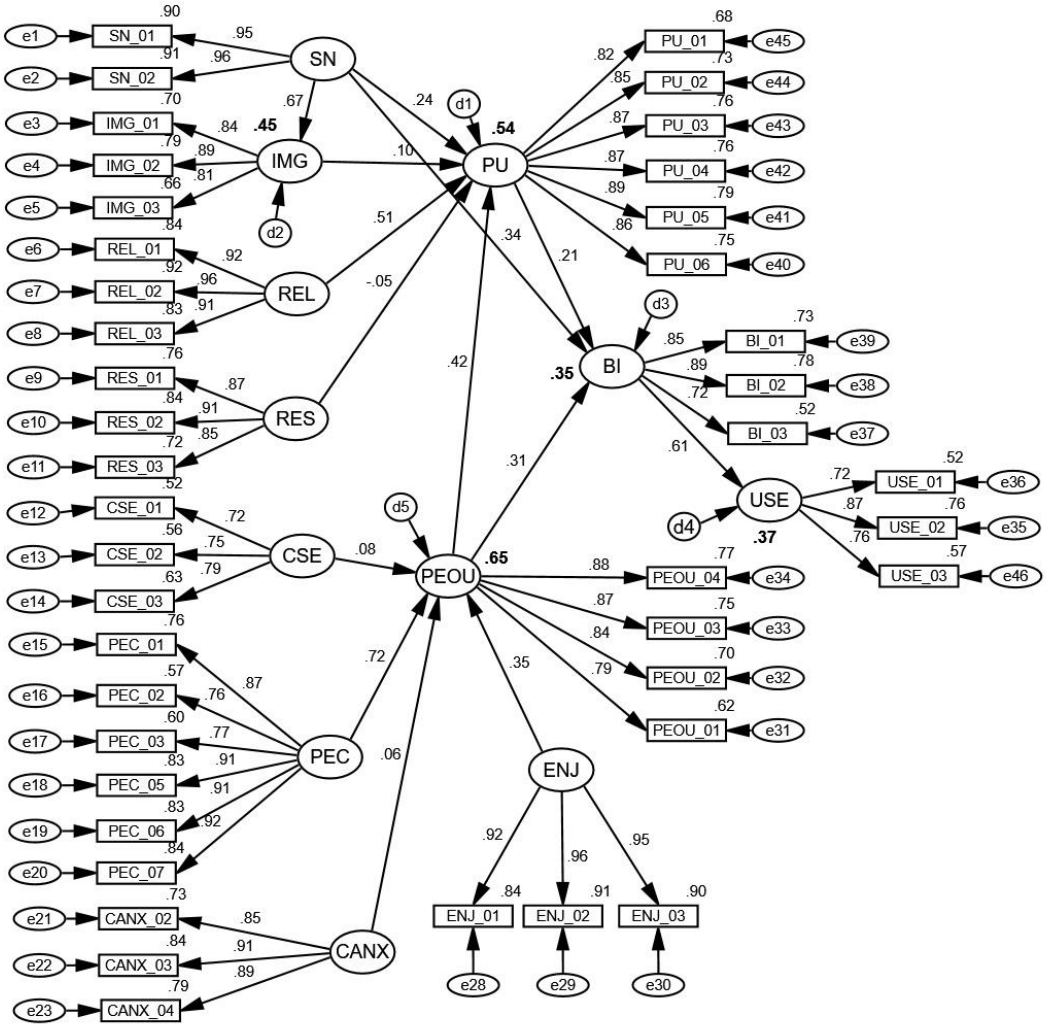
The GOF, the significance of the model, and the size of the structural parameter estimates were assessed, and substantive inferences made according to the standardised parameter estimates. Khine (2013, p. 16) stated that a "*model that fits the data well but has few significant parameters is not desirable*" and thus, it is necessary to review the significance of the estimated parameter estimates.

The standardised estimated parameters of the current study were interpreted to link any direct empirical evidence with the already hypothesised relationships in the proposed the TAM 3. The overall fit of the model was assessed and validated by comparing the x^2 *GOF* for the measurement model fit, and the x^2 *GOF* for the structural model. Hair et al. (2014, p. 587) stated that when the structural model GOF is closer to the measurement model, the structural model fit becomes better, "*because the measurement model fit provides an upper bound to the GOF of a conventional structural model*".

The main estimation method selected for the current study was the MLE method, which Hair et al. (2014) suggested possesses valid and stable findings, even when the sample size is as small as 50, although with a sample size greater than 400, the method is more sensitive (Tanaka (1993), and is able to detect differences that compromise the GOF. Hair et al. (2014) claimed that MLE method is a flexible approach to parameter estimations, and is more efficient and unbiased, provided the assumptions of multivariate normality are met.

The parameter estimates were run using the MLE method, and Figure 4-2 shows the path diagram employed. The values of the factor loadings are indicated on top of the respective items, while the squared multiple correlations for the main constructs in the model are indicated in bold. The sample size for the full data was $N = 10{,}711$. Perceived Ease of Use ($\beta = .653$) was found to have the strongest squared multiple correlation estimate, followed by Perceived Usefulness ($\beta = .539$), Image ($\beta = .447$), Use Behaviour ($\beta = .369$), then Behavioural Intention ($\beta = .351$).

Figure 4-2:MLE Noor System Model.



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

The overall hypotheses were estimated using the MLE estimates. TAM 3 includes the three main moderators of Output Quality, Experience, and Voluntariness. However, some hypotheses were not moderated, and only their direct relationships were investigated. The hypotheses that were not investigated for moderation in the Noor system included, H1, H2, H7, H8, H10, H11, and H12. The relationship between Job Relevance and Perceived Usefulness (H9a) was moderated by Objective Usability. The other relationships moderated by either Experience or Voluntariness are shown in Figure 3-1.

4.12. Conclusion

In summary, Chapter 4 reviewed the research methodology that was employed to investigate the Noor system in the KSA. The research philosophy was discussed through investigating the differences between positivist and interpretivist paradigms, and the development and the operationalisation of the survey instruments employed in the study, and the design of the questionnaires was discussed. The questions included in the three questionnaires were developed using literature reviews, as shown in Table 4.2 and Table 4.3, which ensured that all of the TAM 3 constructs were thoroughly reviewed. It should be noted for purposes of clarification that the questionnaires included 51 items, which were designed using a seven-point Likert scale, while the questions regarding Computer Self-Efficacy were designed using a 10-point Guttman scale. It should also be noted that the questions regarding socio-demographics were not developed from TAM 3, but rather were based on the extant literature regarding the influence of socio-demographics on dependent variables. Meanwhile, the other questions were developed based on the preliminary face-to-face interviews conducted prior to the commencement of the main study.

The research approach and design of this study was stated and explained in terms of the main study design, and the sampling procedures and design were explained by describing the stratified sampling technique. The selection of the target population, the sampling frame, and the sampling technique were also described.

This chapter explained that the pilot study was comprised of residents from the Al-Qassim province alone, and that the findings were used to develop, and to improve on the questions included in the final questionnaires. It also explained that, in addition, the pilot study was conducted in order to identify any problems that might affect the proposed data collection method.

The processes through which the reliability and the validity of the questionnaires were assessed was described. The reliability of the items (questions) was examined using Cronbach's alpha coefficients, based on Nunnally (1978) recommendations, and those that did not meet the required threshold were deleted from the questionnaires. The validity of the questionnaires was achieved by the fact that only the users of the Noor system who had registered email accounts with the Noor system participated in the study.

This chapter described the SEM techniques that were employed as the study's main analytical procedure, since it is important to review the steps that were undergone to run SEM, especially because AMOS was employed in the final analysis. It was also crucial to explain the sampling technique, and the sample size, since the SEM analysis is dependent on the sample size (Khine, 2013; Hair et al., 2014). Finally, the model specification, identification, estimation, evaluation, and modification and validation of the SEM theoretical model were described.

The next chapter investigates the findings of the data analysis, which is presented according to the teachers, parents, and students, and a comparison is made between Saudis and non-Saudis. The findings are presented in the form of tables and figures, most of which are included in the appendices.

5 CHAPTER FIVE: STRUCTURAL EQUATION MODELLING ON THE NOOR SYSTEM

5.1. Introduction

In this section, the general hypotheses testing all the 19 relationships that were under investigation in the current study are investigated and reported. However, since Computer Playfulness and Objective Usability failed to meet the required minimum threshold in terms of their factor loadings, they were removed from the final model. Thus, only 17 hypotheses remain under investigation in the study.

Structural Equation Modelling was adopted as the main data analysis method for the current study, where the parameter estimates of the Maximum Likelihood Estimation were used to confirm the significance of all 16 main TAM 3 hypotheses. The interpretation of the significance of the hypotheses was based on the signage on the *beta* estimate values, and on the *p* values. It is important to remember that the sample size for the current study was 10,711 participants. However, testing of the normality of this massive dataset revealed that it was abnormal. The data was also found to have inflated relative fit indices. This prompted further investigation and cleaning of the data, to normalise it. It was discovered that the data had unengaged responses; these were discovered by assessing the pattern of the responses given by the respondents. Approximately 16 participants were found to have unengaged responses: that is, they either responded ‘strongly agree’ or ‘strongly disagree’ to all the questions that they were asked. The unengaged respondents were then removed from the study, although this did not improve the model fit. Thus, it was deemed appropriate to retain them in the model. This decision was made on the basis of the massive dataset that was collected for the Noor study, in which the literature suggested that the sampling error reduces as the sample size increases.

The hypothesis testing under Structural Equation Modelling was based on the data collected from the teachers, the parents, and the students. The data was categorised into these three groups to allow for proper investigations in terms of the mandatory and the voluntary settings. These were deemed appropriate because, if the three groups were all compared under one pooled sample, any generalisation of the final findings of the study could have been flawed. This would not have made it possible to differentiate the findings for the mandatory and the voluntary settings. Likewise, comparative hypotheses findings for the three groups are discussed. However, it is important to mention that, although all the 14 main hypotheses are compared on the basis of their *beta* estimates and p values, the current study places a great deal of emphasis on the effect of Perceived Ease of Use on Behavioural Intention (H3), the effect of Perceived Usefulness on Behavioural Intention (H2), and the effect of Subjective Norm on Behavioural Intention (H5) as the core of the current study.

5.2. General Hypotheses Testing

The direct hypotheses were estimated using the parameter estimates. The findings, which are shown in Table 5.1, were interpreted according to both the signage of their standardised estimates and the p values. All of the hypotheses tested in the model were reported to have a significant effect. However, the hypothesis between Perceived Ease of Use<---Computer Playfulness, and between Objective Usability<---Perceived Ease of Use were not estimated in the final model, as they were removed from the model when they failed to meet the required SEM guidelines. Overall, the relationship between Perceived Ease of Use <---Perceptions of External Control ($\beta = .721$; $p < .001$) had the strongest effect, followed by the relationship between Use Behaviour <---Behavioural Intention ($\beta = .608$; $p < .001$), and Image <---Subjective Norm ($\beta = .669$; $p < .001$). Nevertheless, the relationship between Behavioural Intention <---Subjective Norm ($\beta = .338$; $p < .001$) had the strongest effect, when compared with Behavioural Intention <---Perceived Ease of Use ($\beta = .306$; $p < .001$), and Behavioural Intention <---Perceived Usefulness ($\beta = .212$; $p < .001$). The relationships between Perceived Usefulness <---Results Demonstrability ($\beta = -.050$; $p < .001$), and Perceived Ease of Use <---Computer Anxiety ($\beta = .061$; $p < .001$), were found to have the least significant effects in the Noor system model. See Table 5.1 for more findings on the testing of the hypotheses without categorising the data into the three groups of teachers, students, and parents.

Table 5.1: Standardised Regression Weights for the overall model.

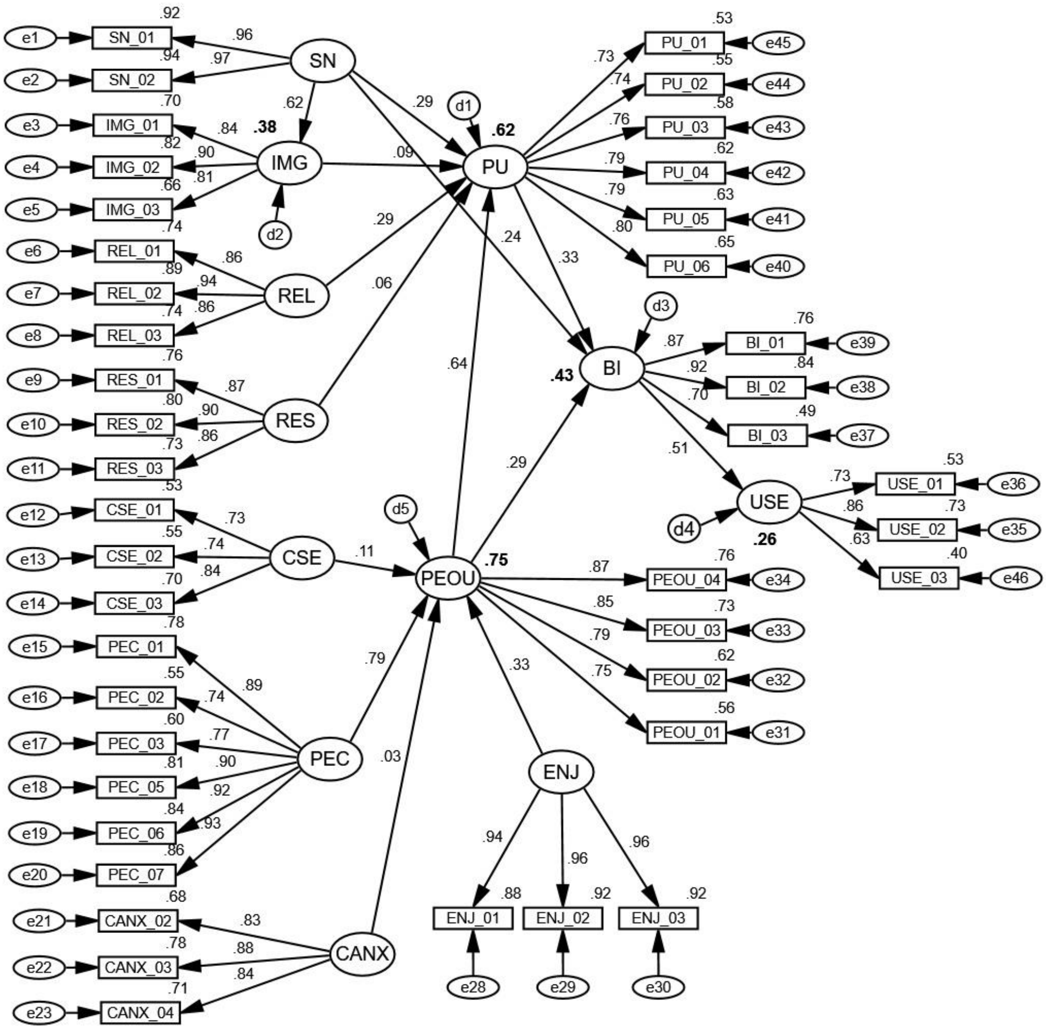
Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H1: USE <---BI	0.608	0.010	53.92	<.001
H2: BI <---PU	0.212	0.011	19.85	<.001
H3: BI <---PEOU	0.306	0.009	29.54	<.001
H4: PU <---PEOU	0.418	0.007	51.05	<.001
H5: BI <---SN	0.338	0.007	34.85	<.001
H6: PU <---SN	0.239	0.008	22.43	<.001
H7: IMG <---SN	0.669	0.009	70.53	<.001
H8: PU <---IMG	0.100	0.008	9.25	<.001
H9: PU <---REL	0.512	0.006	61.90	<.001
H10: PU <---RES	-0.050	0.006	-6.73	<.001
H11: PEOU <---CSE	0.081	0.006	10.90	<.001
H12: PEOU <---PEC	0.721	0.007	84.88	<.001
H13: PEOU <---CANX	0.061	0.007	8.80	<.001
H14: PEOU <---CPLAY	*NERM*	_	_	_
H15: PEOU <---ENJ	0.351	0.005	49.98	<.001
H16: PEOU <---OU	*NERM*	_	_	_

Notes: NERM=Not Estimated Removed from the Model; PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability.

5.2.1. Teachers' Data

The sample size for the teachers' data was *N*=1,655. Perceived Ease of Use (β = .75) was found to have the strongest squared multiple correlation estimate. This was followed by Perceived Usefulness (β = .62), with Behavioural Intention in third place (β = .43), Image in fourth place (β = .38), and Use Behaviour coming last (β = .26). See Figure 5-1 for more details. Table 5.2 shows that all of the hypotheses that were investigated using the teachers' data were significant.

Figure 5-1: MLE Teachers' model.



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

Table 5.2: Teachers' Standardised Regression Weights.

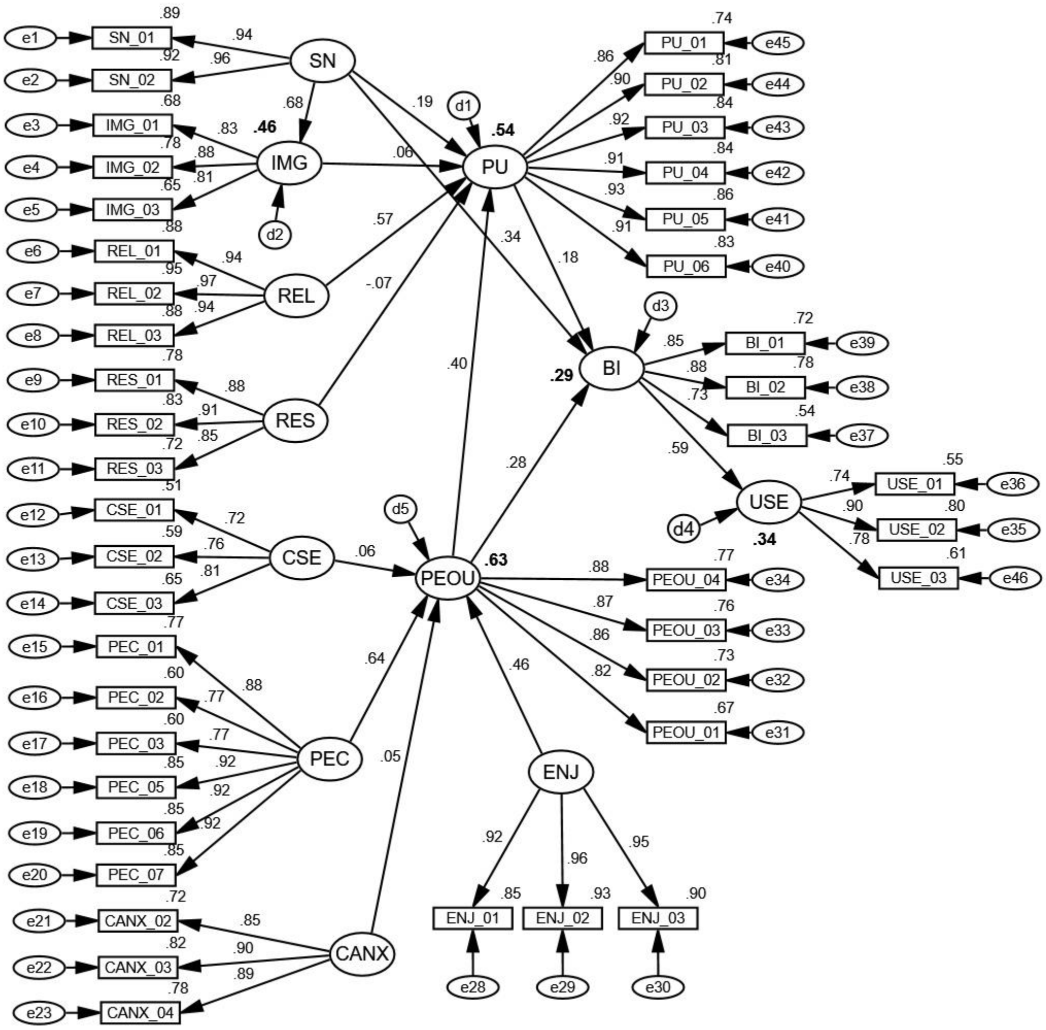
Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H1: USE <---BI	0.511	0.023	17.87	.048
H2: BI <---PU	0.333	0.04	9.45	<.001
H3: BI <---PEOU	0.287	0.028	8.95	<.001
H4: PU <---PEOU	0.643	0.019	25.55	<.001
H5: BI <---SN	0.243	0.018	9.97	<.001
H6: PU <---SN	0.288	0.017	11.42	<.001
H7: IMG <---SN	0.619	0.022	25.63	<.001
H8: PU <---IMG	0.089	0.018	3.52	<.001
H9: PU <---REL	0.292	0.014	14.50	<.001
H10: PU <---RES	0.061	0.014	3.23	0.001
H11: PEOU <---CSE	0.111	0.014	6.51	<.001
H12: PEOU <---PEC	0.792	0.018	38.25	<.001
H13: PEOU <---CANX	0.032	0.019	1.97	0.047
H14: PEOU <---CPLAY	*NERM*	_	_	_
H15: PEOU <---ENJ	0.331	0.013	20.50	<.001
H16: PEOU <---OU	*NERM*	_	_	_

Notes: NERM=Not Estimated Removed from the Model; PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability.

5.2.2. Parents' Data

The sample size for the parents was N=5,390. Perceived Ease of Use (β = .63) was found to have the strongest squared multiple correlation estimate; this followed by Perceived Usefulness (β = .54). Image was third (β = .46), Use Behaviour (β = .34) was fourth, and Behavioural Intention had the lowest squared multiple correlation estimate (β = .29). See Figure 5-2. The results of all of the hypotheses that were tested using the data collected from parents were found to be significant. See Table 5.3.

Figure 5-2:MLE Parents' model.



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

Table 5.3: Parents' Standardised Regression Weights.

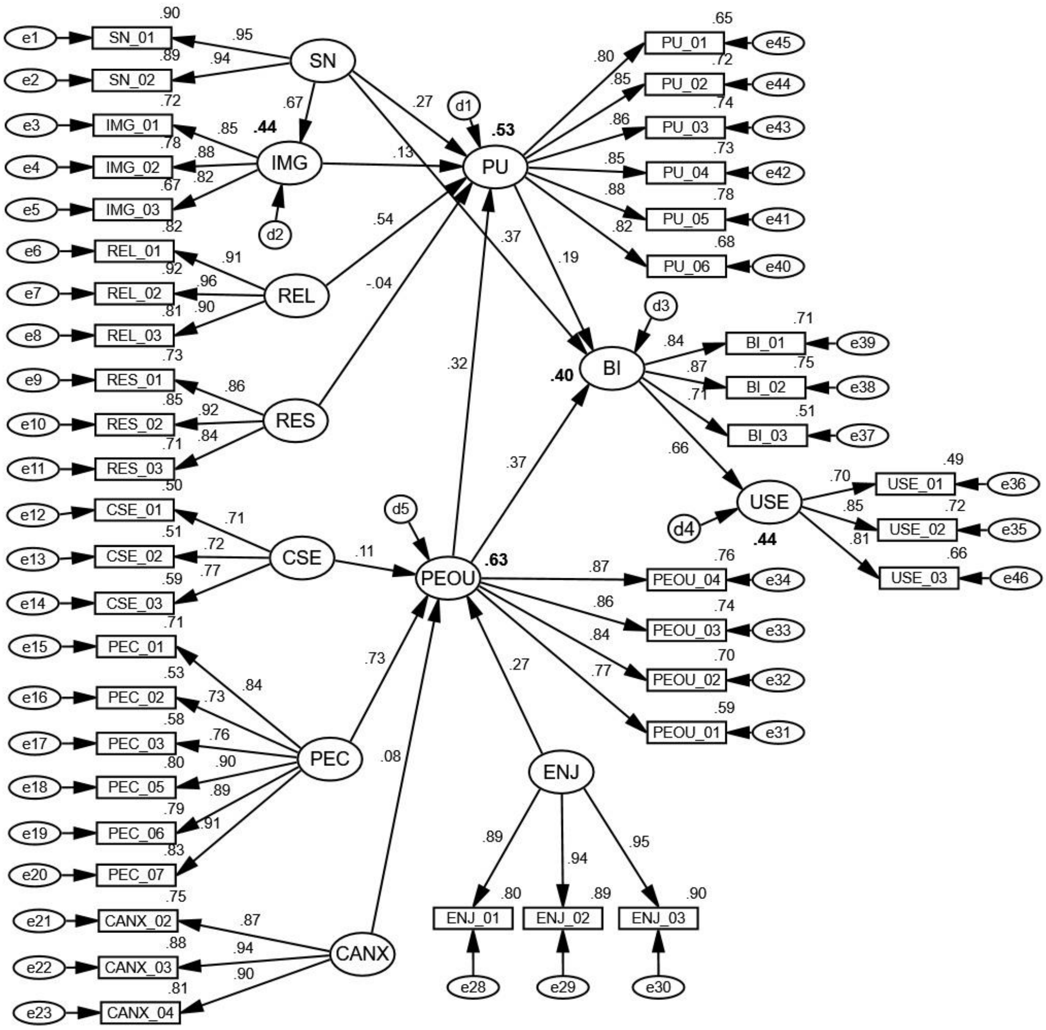
Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H1: USE <---BI	0.586	0.015	37.70	<.001
H2: BI <---PU	0.178	0.013	12.13	<.001
H3: BI <---PEOU	0.275	0.013	18.70	<.001
H4: PU <---PEOU	0.397	0.01	35.95	<.001
H5: BI <---SN	0.340	0.009	24.83	<.001
H6: PU <---SN	0.187	0.011	12.53	<.001
H7: IMG <---SN	0.682	0.013	50.37	<.001
H8: PU <---IMG	0.058	0.013	3.79	<.001
H9: PU <---REL	0.568	0.009	50.56	<.001
H10: PU <---RES	-0.07	0.009	-6.73	<.001
H11: PEOU <---CSE	0.064	0.008	6.06	<.001
H12: PEOU <---PEC	0.643	0.01	55.92	<.001
H13: PEOU <---CANX	-0.053	0.009	5.39	<.001
H14: PEOU <---CPLAY	NERM	_	_	_
H15: PEOU <---ENJ	0.463	0.008	45.06	<.001
H16: PEOU <---OU	NERM	_	_	_

Notes: NERM=Not Estimated Removed from the Model; PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability.

5.2.3. Students' Data

The sample size for the students was *N*=3,666. Perceived Ease of Use (β = .63) was found to have the strongest squared multiple correlation estimate, followed by Perceived Usefulness (β = .53). Use Behaviour and Image both have (β = .44), while Behavioural Intention was only (β = .40). See Figure 5-3 for more details.

Figure 5-3: MLE Students' model.



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

Table 5.4 shows that the results of all the hypotheses tested using the students' model were significant.

Table 5.4: Students' Standardised Regression Weights.

Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H1: USE <---BI	0.661	0.018	33.53	<.001
H2: BI <---PU	0.185	0.018	10.60	<.001
H3: BI <---PEOU	0.368	0.016	21.76	<.001
H4: PU <---PEOU	0.325	0.012	23.56	<.001
H5: BI <---SN	0.373	0.012	22.27	<.001
H6: PU <---SN	0.274	0.013	14.76	<.001
H7: IMG <---SN	0.666	0.015	41.27	<.001
H8: PU <---IMG	0.125	0.014	6.66	<.001
H9: PU <---REL	0.538	0.01	36.56	<.001
H10: PU <---RES	-0.038	0.01	-2.97	0.003
H11: PEOU <---CSE	0.115	0.01	8.51	<.001
H12: PEOU <---PEC	0.733	0.014	47.41	<.001
H13: PEOU <---CANX	0.084	0.011	-6.95	<.001
H14: PEOU <---CPLAY	*NERM*	_	_	_
H15: PEOU <---ENJ	0.272	0.009	22.13	<.001
H16: PEOU <---OU	*NERM*	_	_	_

Notes: NERM=Not Estimated Removed from the Model; PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability.

5.3. Comparative Hypotheses on Groups

In the current study, H2, H3 and H5 were considered as the backbone of the Noor system study. In these three hypotheses, the impacts of Perceived Usefulness, Perceived Ease of Use, and Subjective Norm on Behavioural Intention were investigated. The comparative findings shown in Table 5.5 show that the findings for the parents and those of the students followed a similar pattern, namely that Subjective Norm had the strongest effect on Behavioural Intention, followed by Perceived Ease of Use, and then Perceived Usefulness. However, the case for the teachers was different. Perceived Usefulness had the strongest effect on Behavioural Intention, followed by Perceived Ease of Use and Subjective Norm.

Table 5.5: Comparative Group Standardised Regression Weights.

Hypotheses	Teachers' Estimates	Parents' Estimate	Students' Estimate
H1: USE <---BI	0.511	0.586	0.661
H2: BI <---PU	0.333	0.173	0.185
H3: BI <---PEOU	0.287	0.288	0.368
H4: PU <---PEOU	0.643	0.397	0.325
H5: BI <---SN	0.243	0.338	0.373
H6: PU <---SN	0.288	0.187	0.274
H7: IMG <---SN	0.619	0.682	0.666
H8: PU <---IMG	0.089	0.058	0.125
H9: PU <---REL	0.292	0.567	0.538
H10: PU <---RES	0.061	-0.07	-0.038
H11: PEOU <---CSE	0.111	0.064	0.115
H12: PEOU <---PEC	0.792	0.643	0.733
H13: PEOU <---CANX	0.032	0.053	0.084
H14: PEOU <---CPLAY	NERM	NERM	NERM
H15: PEOU <---ENJ	0.331	0.463	0.272
H16: PEOU <---OU	NERM	NERM	NERM

Notes: NERM=Not Estimated Removed from the Model; PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability.

The comparative *R*-squared values for the three groups were investigated and compared with similar values obtained from the TAM 3 Venkatesh and Bala (2008), and Al-Gahtani (2016). The findings regarding Behavioural Intention and Perceived Usefulness that were obtained in the Noor system study were similar to the findings obtained by the TAM 3 and Al-Gahtani (2016). However, the values obtained by the Noor system for Perceived Ease of Use were higher than those obtained by Al-Gahtani (2016) or the TAM 3. See Table 5.6.

Table 5.6: Comparative R-Squared Values on Groups.

Main constructs	Full model	T	P	S	Al-Gahtani (2016)	TAM 3(*T1*)	TAM 3(*pooled*)
PEOU	0.65	0.75	0.63	0.63	0.45	0.43	0.44
PU	0.54	0.62	0.54	0.53	0.42	0.60	0.52
IMG	0.45	0.38	0.46	0.44	0.13		
BI	0.35	0.43	0.29	0.40	0.42	0.48	0.40
USE	0.37	0.26	0.34	0.44			0.31

Notes: PEOU=Perceived Ease of USE, PU=Perceived Usefulness, IMG=Image, BI=Behavioural Intention, USE=Use Behaviour, T=Teachers', P=Parents', S=Students'. Venketash, 2008 measured Image, but did not report its R- squared value.

5.4. Conclusion

In summary, Chapter Five has reviewed the main data analysis undertaken in the current study, namely Structural Equation Modelling. It is important to reiterate that the Noor system study was designed to investigate three main groups, i.e. teachers, parents, and the students. The main reason for investigating these three groups simultaneously was to compare the significant relationships in the TAM 3, especially under two system settings. In this case, this refers to the mandatory and the voluntary settings. In the current study, therefore, the teachers were considered to be using the Noor system in a mandatory setting, while the students and their parents were considered to be using the Noor system in voluntary settings.

The findings of the Structural Equation Modelling were presented in table formats, and the findings for the three groups were presented separately. The hypotheses were arranged from hypothesis one up to hypothesis number nineteen. The most important aspect of interpreting the findings was based on the signage of their *beta* estimate and p values. All three groups were investigated using the same path diagram. However, although the R-squared values for Use Behaviour, Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness were presented, they were all different. Among the three groups, it was found that Perceived Ease of Use explained the highest level of variance; this was followed by Perceived Usefulness. This led to the conclusion that, in the context of the KSA, Perceived Ease of Use was the strongest construct in the TAM 3, followed by Perceived Usefulness. Likewise, it was important to state that the variance explained by Perceived Ease of Use was much stronger in the mandatory setting than in the voluntary setting.

It is also worth noting that a comparative analysis of the *beta* estimates for the three groups has been conducted. The purpose of these comparisons was to ascertain under which system setting the postulated hypotheses were stronger. Similarly, the findings for the main constructs under the Noor system have been compared with the findings from Venkatesh and Bala (2008) and Al-Gahtani (2016). Once again, it is important to note that these two studies were chosen because the TAM 3 that was used in these two studies is similar to the model that was used in the current study.

6 CHAPTER SIX: MODERATION AND INTERACTION TESTING

6.1. Introduction

In this section, the findings of the multigroup analysis will be presented. The first basic moderation testing reported will be the group analysis, i.e. the parents, students, and teachers. Similarly, the findings relating to Nationality, the Noor System Experience, Gender, Internet Proficiency, Internet Access at Work, Internet Access at Home, Internet Experience, Age, and Educational Level will be discussed. Likewise, the two-way and three-way interactions based on the TAM 3 will be discussed.

6.2. Group Moderation

In the group moderation, the data relating to the teachers, the students, and the parents were investigated for moderating effects. The relative fit indices measures for the group model are shown in Table 6.1.

Table 6.1: The fit indices measures; Group model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Group	32.39	<.001	0.695	0.841	0.830	0.845	0.834	0.845	0.054	0.364

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Group= multigroup analysis for the Teachers' the Parents' and the Students'.

6.2.1. Teachers and Students

Table 6.2 shows a comparative analysis of teachers and students. The relationship between Perceived Usefulness and Behavioural Intention had the weakest significant effect, where the moderating effect was weaker among the students than among the teachers. There was a significant and strong positive moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention; this effect was stronger among the students than the teachers. Similarly, the strongest significant moderating effect was observed in the relationship between Subjective Norm and Behavioural Intention; again, this effect was stronger among the students than the teachers.

Table 6.2: Moderation testing between Teachers and Students.

Hypotheses	Teachers' *Estimate*	*p*	Students' *Estimate*	*p*	*z*-score
H1: USE <---BI	0.408	<.001	0.609	<.001	6.887***
H2: BI <---PU	0.381	<.001	0.194	<.001	-4.225***
H3: BI <---PEOU	0.250	<.001	0.343	<.001	2.886***
H4: PU <---PEOU	0.490	<.001	0.289	<.001	-8.83***
H5: BI <---SN	0.183	<.001	0.270	<.001	3.979***
H6: PU <---SN	0.189	<.001	0.190	<.001	0.018
H7: IMG <---SN	0.569	<.001	0.631	<.001	2.268**
H8: PU <---IMG	0.063	<.001	0.091	<.001	1.233
H9: PU <---REL	0.204	<.001	0.371	<.001	9.681***
H10: PU <---RES	0.046	0.001	-0.030	0.003	-4.346***
H11: PEOU <---CSE	0.091	<.001	0.087	<.001	-0.207
H12: PEOU <---PEC	0.695	<.001	0.663	<.001	-1.408
H13: PEOU <---CANX	0.038	0.048	0.074	<.001	1.598
H15: PEOU <---ENJ	0.262	<.001	0.205	<.001	-3.635***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.2.1.1. Teachers and Parents

Table 6.3 shows a comparative analysis of teachers and parents. The relationship between Perceived Usefulness and Behavioural Intention had the weakest significant effect and the moderating effect was weaker among the parents than among the teachers. However, there was no significant moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention. Nevertheless, there was a strong significant moderating effect on the relationship between Subjective Norm and Behavioural Intention; this effect was stronger among the parents than among the teachers.

Table 6.3: Moderation testing between Teachers and Parents.

Hypotheses	Teachers' *Estimate*	*p*	Parents' *Estimate*	*p*	*z*-score
H1: USE <---BI	0.408	<.001	0.572	<.001	6.001***
H2: BI <---PU	0.381	<.001	0.161	<.001	-5.18***
H3: BI <---PEOU	0.250	<.001	0.236	<.001	-0.448
H4: PU <---PEOU	0.490	<.001	0.376	<.001	-5.204***
H5: BI <---SN	0.183	<.001	0.237	<.001	2.63***
H6: PU <---SN	0.189	<.001	0.144	<.001	-2.262**
H7: IMG <---SN	0.569	<.001	0.637	<.001	2.659***
H8: PU <---IMG	0.063	<.001	0.048	<.001	-0.715
H9: PU <---REL	0.204	<.001	0.435	<.001	14.03***
H10: PU <---RES	0.046	0.001	-0.060	<.001	-6.296***
H11: PEOU <---CSE	0.091	<.001	0.048	<.001	-2.666***
H12: PEOU <---PEC	0.695	<.001	0.547	<.001	-7.166***
H13: PEOU <---CANX	0.038	0.048	0.049	<.001	0.507
H15: PEOU <---ENJ	0.262	<.001	0.357	<.001	6.34***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.2.2. Students and Parents

Table 6.4 shows a comparative analysis of students and parents. No significant effect was found on the relationship between Perceived Usefulness and Behavioural Intention. However, there was a significant negative moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention, where the effect was weaker among the parents than among the students. Similarly, there was a significant negative moderating effect on the relationship between Subjective Norm and Behavioural Intention; this effect was also weaker among the parents than among the students.

Table 6.4: Moderation testing between Students' and Parents'.

Hypotheses	Students' *Estimate*	*p*	Parents' *Estimate*	*p*	*z*-score
H1: USE <---BI	0.609	<.001	0.572	<.001	-1.536
H2: BI <---PU	0.194	<.001	0.161	<.001	-1.452
H3: BI <---PEOU	0.343	<.001	0.236	<.001	-5.264***
H4: PU <---PEOU	0.289	<.001	0.376	<.001	5.416***
H5: BI <---SN	0.270	<.001	0.237	<.001	-2.143**
H6: PU <---SN	0.190	<.001	0.144	<.001	-2.669***
H7: IMG <---SN	0.631	<.001	0.637	<.001	0.345
H8: PU <---IMG	0.091	<.001	0.048	<.001	-2.344**
H9: PU <---REL	0.371	<.001	0.435	<.001	4.75***
H10: PU <---RES	-0.030	0.003	-0.060	<.001	-2.155**
H11: PEOU <---CSE	0.087	<.001	0.048	<.001	-3.025***
H12: PEOU <---PEC	0.663	<.001	0.547	<.001	-6.775***
H13: PEOU <---CANX	0.074	<.001	0.049	<.001	-1.75*
H15: PEOU <---ENJ	0.205	<.001	0.357	<.001	12.533***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

With regard to H17a, this hypothesis was rejected, and it was concluded that the influence of Perceived Usefulness and Perceived Ease of Use on Behavioural Intention toward using the Noor system will be moderated by the teachers and the students. When comparing the teachers and parents, a significant moderating role was only observed on the effect of Perceived Usefulness on Behavioural Intention, thus rejecting H17a and leading to the conclusion that the influence of Perceived Usefulness on Behavioural Intention towards using the Noor system will be moderated by the teachers and the parents. However, the effect of Perceived Ease of Use on Behavioural Intention H17a was retained and it was concluded that the influence of Perceived Ease of Use on Behavioural Intention toward using the Noor system would not be moderated by the teachers and the parents. The parents and the students were not found to have any moderating role on the effect of Perceived Usefulness on Behavioural Intention, thus confirming H17a. On the contrary, a significant moderating role was observed on the effect of Perceived Ease of Use on Behavioural Intention, thus rejecting

H17a and leading to the conclusion that the effect of Perceived Ease of Use on Behavioural Intention would be moderated by the teachers and students.

6.3. Nationality (Saudi and non-Saudis)

Moderation testing was also performed based on the nationality of the respondents. The data was split into two categories: Saudi and non-Saudi citizens. The preliminary descriptive analysis revealed that the sample was comprised of 8,032 Saudi citizens (75%), and 2,679 non-Saudi citizens (25%). The relative fit indices measures are shown on Table 6.5.

Table 6.5: The fit indices measures; Nationality model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Nationality	45.89	<.001	0.706	0.843	0.832	0.846	0.835	0.846	0.065	0.345

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Nationality Model = Saudi and non-Saudis.

Table 6.6 shows that Nationality had the strongest significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention; this effect was stronger among non-Saudis than among Saudi citizens. No significant moderating effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention. However, , there was a significant moderating effect on the relationship between Subjective Norm and Behavioural Intention, where the effect was strongest for the non-Saudis, compared to Saudis.

Table 6.6: Moderation testing between Saudis and non-Saudis.

	Saudis		non-Saudis		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.518	<.001	0.607	<.001	3.345***
H2: BI <---PU	0.198	<.001	0.258	<.001	2.545***
H3: BI <---PEOU	0.261	<.001	0.285	<.001	1.035
H4: PU <---PEOU	0.363	<.001	0.357	<.001	-0.289
H5: BI <---SN	0.260	<.001	0.201	<.001	-3.818***
H6: PU <---SN	0.200	<.001	0.092	<.001	-6.456***
H7: IMG <---SN	0.625	<.001	0.617	<.001	-0.340
H8: PU <---IMG	0.082	<.001	0.049	<.001	-1.927*
H9: PU <---REL	0.352	<.001	0.452	<.001	6.75***
H10: PU <---RES	-0.049	<.001	-0.021	0.109	1.796*
H11: PEOU <---CSE	0.069	<.001	0.043	<.001	-2.026**
H12: PEOU <---PEC	0.636	<.001	0.568	<.001	-3.662***
H13: PEOU <---CANX	0.057	<.001	0.056	<.001	-0.046
H15: PEOU <---ENJ	0.276	<.001	0.247	<.001	-2.323**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

A significant moderating role on the effect of Perceived Usefulness on Behavioural Intention was observed with regard to Nationality. This led to the rejection of H17b, and to the conclusion that nationality has a moderating role on the effect of Perceived Usefulness on Behavioural Intention. With regard to the effect of Perceived Ease of Use on Behavioural Intention, no moderating role was reported, thus leading to the retention of H17b and the conclusion that Nationality had no moderating role on the effect of Perceived Ease of Use on Behavioural Intention.

6.4. Noor System Experience

The data relating to experience of the Noor system were categorised as follows: less than six months' experience (*N*=1,546); 6-12 months' experience (*N*=1,024), 1-2 years' experience (*N*=2,104), 2-3 years' experience (*N*=2,098); 3-4 years' experience (*N*=1,598), and more than 4 years of experience (*N*=2,341). The relative fit indices are shown in Table 6.7.

Table 6.7: The Fit Indices Measures; Noor System Experience Model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Experience	16.60	<.001	0.693	0.835	0.824	0.844	0.833	0.843	0.038	0.422

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Noor system experience Model.

6.4.1. Experience of Less Than 6 Months and 6-12 Months

Table 6.8 shows that Noor Experience had no significant effect on the relationship between Perceived Usefulness and Behavioural Intention. However, a stronger significant effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention. This effect was much stronger for those who had 6-12 months' experience of the Noor system than for those with less than six months' experience. Similarly, there was a significant negative moderating effect on the relationship between Subjective Norm and Behavioural Intention, where the effect was weakest for those respondents who had less than six months of Noor experience, compared to those who had 6-12 months experience.

Table 6.8: Moderation testing on Experience between < 6 months and 6-12 months.

	< 6 months		6-12 months		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.584	<.001	0.665	<.001	1.772*
H2: BI <---PU	0.304	<.001	0.282	<.001	-0.464
H3: BI <---PEOU	0.148	<.001	0.242	<.001	2.526**
H4: PU <---PEOU	0.407	<.001	0.365	<.001	-1.507
H5: BI <---SN	0.294	<.001	0.222	<.001	-2.558**
H6: PU <---SN	0.179	<.001	0.144	<.001	-1.178
H7: IMG <---SN	0.673	<.001	0.648	<.001	-0.666
H8: PU <---IMG	0.018	0.461	0.01	0.639	-0.230S
H9: PU <---REL	0.319	<.001	0.446	<.001	5.264***
H10: PU <---RES	-0.042	0.003	-0.109	<.001	-2.913***
H11: PEOU <---CSE	0.023	0.093	0.042	0.01	0.922
H12: PEOU <---PEC	0.683	<.001	0.748	<.001	2.038**
H13: PEOU <---CANX	0.011	0.464	0.07	<.001	2.435**
H15: PEOU <---ENJ	0.259	<.001	0.207	<.001	-2.361**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.4.2. Experience 6-12 Months and 1-2 Years

Table 6.9 shows that Noor experience had the weakest significant effect on the relationship between Perceived Usefulness and Behavioural Intention; this effect was weaker in the under 6 months' experience category than in the 6-12 months category. A strong significant effect was observed on the relationship between Subjective Norm and Behavioural Intention; this effect was much stronger for those who had 1-2 years of Noor experience than for those who only had 6-12 months of experience. However, there was no significant moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention.

Table 6.9: Moderation testing on Experience between 6-12 months and 1-2 years.

	6-12 months		1-2 years		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.665	<.001	0.618	<.001	-1.042
H2: BI <---PU	0.282	<.001	0.167	<.001	-2.835***
H3: BI <---PEOU	0.242	<.001	0.274	<.001	0.931
H4: PU <---PEOU	0.365	<.001	0.416	<.001	1.874*
H5: BI <---SN	0.222	<.001	0.273	<.001	1.953*
H6: PU <---SN	0.144	<.001	0.154	<.001	0.386
H7: IMG <---SN	0.648	<.001	0.614	<.001	-0.925
H8: PU <---IMG	0.010	0.639	0.063	<.001	1.865*
H9: PU <---REL	0.446	<.001	0.364	<.001	-3.436***
H10: PU <---RES	-0.109	<.001	-0.055	<.001	2.311**
H11: PEOU <---CSE	0.042	0.01	0.049	<.001	0.300
H12: PEOU <---PEC	0.748	<.001	0.651	<.001	-3.149***
H13: PEOU <---CANX	0.07	<.001	0.037	0.006	-1.454
H15: PEOU <---ENJ	0.207	<.001	0.254	<.001	2.324**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.4.3. Experience 1-2 Years and 2-3 Years

Table 6.10 shows that Noor experience had no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention. Similarly, no significant moderating effect was observed on the relationship between Subjective Norm and Behavioural Intention. Likewise, there was no significant moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention.

Table 6.10: Moderation testing on Experience between 1-2 years and 2-3 years.

Hypotheses	1-2 years *Estimate*	*p*	2-3 years *Estimate*	*p*	*z*-score
H1: USE <---BI	0.618	<.001	0.556	<.001	-1.749*
H2: BI <---PU	0.167	<.001	0.208	<.001	1.271
H3: BI <---PEOU	0.274	<.001	0.278	<.001	0.145
H4: PU <---PEOU	0.416	<.001	0.347	<.001	-2.913**
H5: BI <---SN	0.273	<.001	0.238	<.001	-1.592
H6: PU <---SN	0.154	<.001	0.133	<.001	-.881
H7: IMG <---SN	0.614	<.001	0.603	<.001	-0.397
H8: PU <---IMG	0.063	<.001	0.077	<.001	0.531
H9: PU <---REL	0.364	<.001	0.440	<.001	3.844***
H10: PU <---RES	-0.055	<.001	-0.005	<.001	2.5**
H11: PEOU <---CSE	0.049	<.001	0.067	<.001	1.007
H12: PEOU <---PEC	0.651	<.001	0.618	<.001	-1.404
H13: PEOU <---CANX	0.037	0.006	0.067	<.001	1.520
H15: PEOU <---ENJ	0.254	<.001	0.287	<.001	1.919*

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.4.4. Experience 2-3 Years and 3-4 Years

Table 6.11 shows that Noor experience had no significant effect on the relationships between Perceived Usefulness and Behavioural Intention; Perceived Ease of Use and Behavioural Intention, and Subjective Norm and Behavioural Intention. Therefore, Noor experience of between 2-3 years and 3-4 years had no significant moderating effect on the relationships between Perceived Usefulness and Behavioural Intention, Perceived Ease of Use and Behavioural Intention, and Subjective Norm and Behavioural Intention.

Table 6.11: Moderation testing on Experience between 2-3 years and 3-4 years.

Hypotheses	2-3 years *Estimate*	*p*	3-4 years *Estimate*	*p*	*z*-score
H1: USE <---BI	0.556	<.001	0.491	<.001	-1.801*
H2: BI <---PU	0.208	<.001	0.241	<.001	0.971
H3: BI <---PEOU	0.278	<.001	0.253	<.001	-0.844
H4: PU <---PEOU	0.347	<.001	0.327	<.001	-0.793
H5: BI <---SN	0.238	<.001	0.231	<.001	-0.268
H6: PU <---SN	0.133	<.001	0.186	<.001	1.96**
H7: IMG <---SN	0.603	<.001	0.642	<.001	1.229
H8: PU <---IMG	0.077	<.001	0.066	0.003	-0.379
H9: PU <---REL	0.440	<.001	0.381	<.001	-2.786***
H10: PU <---RES	-0.005	0.728	-0.002	0.917	0.133
H11: PEOU <---CSE	0.067	<.001	0.048	0.003	-0.896
H12: PEOU <---PEC	0.618	<.001	0.611	<.001	-0.257
H13: PEOU <---CANX	0.067	<.001	0.068	<.001	0.031
H15: PEOU <---ENJ	0.287	<.001	0.283	<.001	-0.187

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.4.5. Experience 3-4 Years and over 4 Years

Table 6.12 shows that Noor experience had no significant effect on the relationship between Perceived Usefulness and Behavioural Intention, or on the relationship between Subjective Norm and Behavioural Intention. However, a significant strong positive effect on the relationship between Perceived Ease of Use and Behavioural Intention was observed, and this was found to be much stronger for respondents with over four years of Noor experience than for those with between three and four years of Noor experience.

Table 6.12: Moderation testing on Experience between 3-4 years and over 4 years.

	3-4 years		Over 4 years		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.491	<.001	0.477	<.001	-0.425
H2: BI <---PU	0.241	<.001	0.192	<.001	-1.365
H3: BI <---PEOU	0.253	<.001	0.310	<.001	1.854*
H4: PU <---PEOU	0.327	<.001	0.394	<.001	2.689***
H5: BI <---SN	0.231	<.001	0.229	<.001	-0.102
H6: PU <---SN	0.186	<.001	0.199	<.001	0.495
H7: IMG <---SN	0.642	<.001	0.615	<.001	-0.892
H8: PU <---IMG	0.066	0.003	0.100	<.001	1.199
H9: PU <---REL	0.381	<.001	0.320	<.001	-2.992***
H10: PU <---RES	-0.002	0.916	-0.029	0.027	-1.268
H11: PEOU <---CSE	0.048	0.003	0.086	<.001	1.823*
H12: PEOU <---PEC	0.611	<.001	0.587	<.001	-0.923
H13: PEOU <---CANX	0.068	<.001	0.066	<.001	-0.101
H15: PEOU <---ENJ	0.283	<.001	0.293	<.001	0.493

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

With regard to experience of the Noor system, a weaker, but still significant, moderating role on the relationship between Perceived Usefulness and Behavioural Intention was observed in respondents with at least two years of experience. This led to the rejection of H17c and the conclusion that the influence of Perceived Usefulness on Behavioural Intention towards using the Noor system will be moderated by the respondents' experience of the Noor system, although this effect will attenuate with time. Similarly, H17c was only rejected for those participants with the highest levels of experience. This led to the conclusion that experience of the Noor system will only have a significant moderating effect on the influence of Perceived Ease of Use on Behavioural Intention towards using the Noor system among the most experienced Noor users.

6.5. Gender

The frequency statistics revealed that there were *N*=8,824 (82.4%) male participants and *N*=1,887 (17.6%) female participants. See Table 6.13 for the relative fit indices for the gender model.

Table 6.13: The fit indices measures; Gender model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Gender	46.96	<.001	0.702	0.844	0.833	0.846	0.836	0.846	0.066	0.383

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual.

Table 6.14 demonstrates that gender had no significant effect on the relationship between Perceived Usefulness and Behavioural Intention, or on the relationship between Subjective Norm and Behavioural Intention. However, a more significant positive effect on the relationship between Perceived Ease of Use and Behavioural Intention was observed to be much stronger for female respondents than for their male counterparts.

Table 6.14: Moderation testing on Experience between males and females.

	Males		Females		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.560	<.001	0.534	<.001	-0.953
H2: BI <---PU	0.216	<.001	0.186	<.001	-1.051
H3: BI <---PEOU	0.263	<.001	0.312	<.001	2.007**
H4: PU <---PEOU	0.390	<.001	0.275	<.001	-6.131***
H5: BI <---SN	0.244	<.001	0.250	<.001	0.294
H6: PU <---SN	0.167	<.001	0.206	<.001	1.944*
H7: IMG <---SN	0.637	<.001	0.620	<.001	-0.682
H8: PU <---IMG	0.082	<.001	0.052	0.007	-1.382
H9: PU <---REL	0.366	<.001	0.394	<.001	1.711*
H10: PU <---RES	-0.044	<.001	-0.038	0.010	0.323
H11: PEOU <---CSE	0.057	<.001	0.083	<.001	1.632
H12: PEOU <---PEC	0.625	<.001	0.658	<.001	1.570
H13: PEOU <---CANX	0.057	<.001	0.066	<.001	0.545
H15: PEOU <---ENJ	0.281	<.001	0.227	<.001	-3.73***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

With regard to gender, no significant moderating role was observed on the effect of Perceived Usefulness on Behavioural Intention; this confirms H17d and leads to the conclusion that gender has no moderating effect on the effect of Perceived Usefulness on Behavioural Intention. However, gender had a strong moderating role on the effect of Perceived Ease of Use on Behavioural Intention, thus rejecting H17d and allowing us to conclude that gender will moderate the effect of Perceived Ease of Use on Behavioural Intention.

6.6. Internet Proficiency

Internet proficiency was measured using a 6-point Likert scale, in which 1 = very low (N =103); 2 = low (N = 121); 3 = satisfactory (N = 1,154); 4 = good (N = 2,066); 5 = very good (N = 3,667); and 6 = excellent (N = 3,600). The relative fit indices for the Internet proficiency model are shown in Table 6.15.

Table 6.15: The fit indices measures; Internet proficiency.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
IP	16.63	<.001	0.694	0.834	0.822	0.842	0.831	0.842	0.038	0.496

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. IP=Internet proficiency.

6.6.1. Internet Proficiency between Very Low (1) and Low (2)

Table 6.16 reveals that Internet proficiency had no significant effect on the relationship between Perceived Usefulness and Behavioural Intention, or on that between Perceived Ease of Use and Behavioural Intention. However, a weaker significant effect on the relationship between Subjective Norm and Behavioural Intention was observed for those who had very low Internet proficiency.

Table 6.16: Moderation testing on Internet proficiency between very low and low.

Hypotheses	Very low Estimate	*p*	Low Estimate	*p*	*z*-score
H1: USE <---BI	0.695	<.001	0.642	<.001	-0.415
H2: BI <---PU	0.162	0.091	0.026	0.837	-0.871
H3: BI <---PEOU	0.339	<.001	0.493	<.001	1.223
H4: PU <---PEOU	0.514	<.001	0.523	<.001	0.093
H5: BI <---SN	0.540	<.001	0.330	<.001	-2.41**
H6: PU <---SN	0.309	0.122	0.246	<.001	-0.300
H7: IMG <---SN	0.841	<.001	0.534	<.001	-2.856***
H8: PU <---IMG	-0.066	0.767	-0.132	0.146	-0.275
H9: PU <---REL	0.107	0.035	0.271	<.001	2.292**
H10: PU <---RES	-0.058	0.338	-0.148	0.001	-1.194
H11: PEOU <---CSE	0.076	0.030	0.009	0.829	-1.217
H12: PEOU <---PEC	0.759	<.001	0.795	<.001	0.407
H13: PEOU <---CANX	0.026	0.586	0.028	0.548	0.028
H15: PEOU <---ENJ	0.111	0.018	0.241	<.001	2.043**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.6.2. Internet Proficiency between Low (2) and Satisfactory (3)

Table 6.17 shows that Internet proficiency had no significant effect on the relationships between Perceived Usefulness and Behavioural Intention; and Perceived Ease of Use and Behavioural Intention. However, a weaker significant effect on the relationship between Subjective Norm and Behavioural Intention was observed in those who had low Internet proficiency than in those with satisfactory Internet proficiency.

Table 6.17: Moderation testing on Internet proficiency between low and satisfactory.

	Low		Satisfactory		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.642	<.001	0.649	<.001	0.069
H2: BI <---PU	0.026	0.837	0.113	0.003	0.671
H3: BI <---PEOU	0.493	<.001	0.378	<.001	-1.087
H4: PU <---PEOU	0.523	<.001	0.479	<.001	-0.668
H5: BI <---SN	0.330	<.001	0.210	<.001	-1.792*
H6: PU <---SN	0.246	<.001	0.136	<.001	-1.569
H7: IMG <---SN	0.534	<.001	0.693	<.001	1.962*
H8: PU <---IMG	-0.132	0.146	0.028	0.199	1.714*
H9: PU <---REL	0.271	<.001	0.302	<.001	0.566
H10: PU <---RES	-0.148	0.001	-0.060	<.001	1.786*
H11: PEOU <---CSE	0.009	0.829	0.053	0.002	0.968
H12: PEOU <---PEC	0.795	<.001	0.781	<.001	-0.202
H13: PEOU <---CANX	0.028	0.548	0.041	0.011	0.259
H15: PEOU <---ENJ	0.241	<.001	0.174	<.001	-1.469

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.6.3. Internet Proficiency between Satisfactory (3) and Good (4)

Table 6.18 Internet proficiency had a stronger significant effect on the relationship between Perceived Usefulness and Behavioural Intention; this effect was strongest for those who had good Internet proficiency than those who had satisfactory Internet proficiency. Similarly, a weaker significant effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention, where the effect was much weaker for those who had satisfactory Internet proficiency than for those with good Internet proficiency. However, there was no significant moderating effect on the relationship between Subjective Norm and Behavioural Intention.

Table 6.18: Moderation testing on Internet proficiency between satisfactory and good.

Hypotheses	Satisfactory *Estimate*	*p*	Good *Estimate*	*p*	*z*-score
H1: USE <---BI	0.779	<.001	0.643	<.001	-2.568**
H2: BI <---PU	0.109	0.004	0.224	<.001	2.527**
H3: BI <---PEOU	0.384	<.001	0.23	<.001	-4.101***
H4: PU <---PEOU	0.479	<.001	0.371	<.001	-3.894***
H5: BI <---SN	0.209	<.001	0.223	<.001	0.542
H6: PU <---SN	0.136	<.001	0.153	<.001	0.634
H7: IMG <---SN	0.692	<.001	0.621	<.001	-1.96**
H8: PU <---IMG	0.028	0.198	0.095	<.001	2.361**
H9: PU <---REL	0.301	<.001	0.329	<.001	1.245
H10: PU <---RES	-0.061	<.001	-0.042	0.004	0.857
H11: PEOU <---CSE	0.054	0.002	0.056	<.001	0.124
H12: PEOU <---PEC	0.781	<.001	0.66	<.001	-4.132***
H13: PEOU <---CANX	-0.041	0.011	-0.062	<.001	-0.966
H15: PEOU <---ENJ	0.174	<.001	0.258	<.001	4.483***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.6.4. Internet Proficiency between Good (4) and Very Good (5)

Table 6.19 reveals that Internet proficiency had a stronger significant effect on the relationship between Perceived Ease of Use and Behavioural Intention; the effect was strongest for those who had very good Internet proficiency. However, there was no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention, or on that between Subjective Norm and Behavioural Intention.

Table 6.19: Moderation testing on Internet proficiency between good and very good.

	Good		Very good		
Hypotheses	*Estimate*	*p*	*Estimate*	*p*	*z*-score
H1: USE <---BI	0.643	<.001	0.722	<.001	2.009**
H2: BI <---PU	0.224	<.001	0.189	<.001	-1.172
H3: BI <---PEOU	0.23	<.001	0.282	<.001	1.985**
H4: PU <---PEOU	0.371	<.001	0.408	<.001	1.779*
H5: BI <---SN	0.223	<.001	0.216	<.001	-0.353
H6: PU <---SN	0.153	<.001	0.172	<.001	0.867
H7: IMG <---SN	0.621	<.001	0.624	<.001	0.123
H8: PU <---IMG	0.095	<.001	0.085	<.001	-0.434
H9: PU <---REL	0.329	<.001	0.379	<.001	2.805***
H10: PU <---RES	-0.042	0.004	-0.073	<.001	-1.709*
H11: PEOU <---CSE	0.056	<.001	0.052	<.001	-0.245
H12: PEOU <---PEC	0.66	<.001	0.59	<.001	-3.267***
H13: PEOU <---CANX	-0.062	<.001	-0.056	<.001	0.306
H15: PEOU <---ENJ	0.258	<.001	0.302	<.001	2.835***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

6.6.5. Internet Proficiency between Very Good (5) and Excellent (6)

Table 6.20 shows that Internet proficiency had a stronger significant effect on the relationship between Subjective Norm and Behavioural Intention, where the effect was strongest for those who had excellent Internet proficiency, compared with those who had very good Internet proficiency. As for the relationship between Perceived Usefulness and Behavioural Intention, the effect was significantly stronger for those who had excellent Internet proficiency than for those who had very good Internet proficiency. However, there was no significant moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention.

Table 6.20: Moderation testing on Internet proficiency between very good and excellent.

Hypotheses	Very good *Estimate*	*p*	Excellent *Estimate*	*p*	*z*-score
H1: USE <---BI	0.722	<.001	0.639	<.001	-2.62***
H2: BI <---PU	0.189	<.001	0.235	<.001	1.794*
H3: BI <---PEOU	0.282	<.001	0.257	<.001	-1.115
H4: PU <---PEOU	0.408	<.001	0.326	<.001	-4.629***
H5: BI <---SN	0.216	<.001	0.268	<.001	3.088***
H6: PU <---SN	0.172	<.001	0.177	<.001	0.284
H7: IMG <---SN	0.624	<.001	0.627	<.001	0.152
H8: PU <---IMG	0.085	<.001	0.067	<.001	-0.923
H9: PU <---REL	0.379	<.001	0.389	<.001	0.69
H10: PU <---RES	-0.073	<.001	0	0.986	4.813***
H11: PEOU <---CSE	0.052	<.001	0.067	<.001	1.037
H12: PEOU <---PEC	0.59	<.001	0.611	<.001	1.197
H13: PEOU <---CANX	-0.056	<.001	-0.055	<.001	0.06
H15: PEOU <---ENJ	0.302	<.001	0.282	<.001	-1.501

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

A significant moderating role by Internet Proficiency was observed among those participants that had high levels of satisfaction. H17e was rejected and it was concluded that, when the level of Internet Proficiency improves to satisfactory or better, this has a significant positive moderating role on the effect of Perceived Usefulness on Behavioural Intention. Similarly, H17e was rejected on the effect of Perceived Ease of Use on Behavioural Intention, which led to the conclusion that Internet Proficiency has a negative moderating role when the user attains a satisfactory level of proficiency, although the moderating role becomes positive when the user attains a very good level of Internet proficiency.

6.7. Internet Access at Work

Internet access at work was investigated using two categories: those who access the Internet at work (N = 5,612; 52.4%), and those who do not have access to the Internet at work (N = 1,022; 9.5%). However, 4,077 (38.1%) of the respondents did not respond to the question about Internet access at work and were, therefore, excluded from the moderation testing. This was expected, as students could not claim that they access the Internet at work. This fact was tested by splitting the data file into groups and running the frequencies. The findings proved that none of the 3,666 students had claimed to have access to the Internet at work, thus making the findings valid. See Table 6.21 for the relative fit indices.

Table 6.21: The fit indices measures; Internet access at work model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
At work	33.22	<.001	0.697	0.841	0.829	0.845	0.834	0.845	0.055	0.385

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Internet access at work.

Internet access at work had no moderating role on the relationship between Perceived Usefulness and Behavioural Intention. However, on the relationship between Perceived Ease of Use and Behavioural Intention, the effect was significant and was much stronger for the respondents who had no Internet access at work than for those who had Internet access at work. Similarly, the effect on the relationship between Subjective Norm and Behavioural Intention was significant and was much stronger for respondents who had no Internet access at work than for those who had Internet access at work. Nevertheless, the moderating effect was significantly stronger on the relationship between Perceived Ease of Use and Behavioural Intention than on the relationship between Subjective Norm and Behavioural Intention. See Table 6.22.

Table 6.22: Moderation testing on Internet access at work.

Hypotheses	*Yes* Estimate	*p*	*No* Estimate	*p*	*z*-score
H1: USE <---BI	0.672	<.001	0.623	<.001	-1.144
H2: BI <---PU	0.202	<.001	0.158	<.001	-0.904
H3: BI <---PEOU	0.245	<.001	0.343	<.001	2.516**
H4: PU <---PEOU	0.403	<.001	0.533	<.001	4.905***
H5: BI <---SN	0.218	<.001	0.265	<.001	1.828*
H6: PU <---SN	0.152	<.001	0.219	<.001	2.432**
H7: IMG <---SN	0.622	<.001	0.675	<.001	1.726*
H8: PU <---IMG	0.075	<.001	0.018	0.502	-1.929*
H9: PU <---REL	0.376	<.001	0.213	<.001	-8.143***
H10: PU <---RES	-0.031	<.001	-0.043	0.032	-0.544
H11: PEOU <---CSE	0.052	<.001	0.081	<.001	1.558
H12: PEOU <---PEC	0.558	<.001	0.699	<.001	5.76***
H13: PEOU <---CANX	-0.049	<.001	-0.06	0.003	-0.477
H15: PEOU <---ENJ	0.36	<.001	0.234	<.001	-6.972***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

Internet access at work had no moderating role on the effect of Perceived Usefulness on Behavioural Intention. Thus, H17f was retained and it was concluded that having access to the Internet at work will not moderate the effect of Perceived Usefulness on Behavioural Intention to use the Noor system. With regard to the effect of Perceived Ease of Use on Behavioural Intention, a significant positive moderating effect was reported; this led to the rejection of H17f and the conclusion that having Internet access at work will moderate the effect of Perceived Ease of Use on Behavioural Intention to use the Noor system.

6.8. Internet Access at Home

Internet access at home was investigated using two categories: those who access the Internet at home (N = 10,261; 95.8%), and those who do not access the Internet at home (N = 450; 4.2%. All of the respondents answered the question on Internet access at home. See Table 6.23 for the relative fit indices.

Table 6.23: The fit indices measures; Internet access at home model.

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Home	48.48	<.001	0.702	0.844	0.833	0.846	0.835	0.846	0.067	0.377

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Educational Level Model 1.

The results indicate that Internet access at home did not moderate the relationship between Perceived Usefulness and Behavioural Intention. However, the relationships between both Perceived Ease of Use and Subjective Norm on Behavioural Intention were found to be moderated by whether or not the respondent had Internet access at home. Internet access at home had the strongest moderating effect on the relationship between Subjective Norm and Behavioural Intention, when compared to the relationship between Perceived Ease of Use and Behavioural Intention. With regard to the relationship between Subjective Norm and Behavioural Intention, the moderating effect was much stronger on the respondents who had no Internet access at home than on those who did have Internet access at home. Similarly, the moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention was much stronger on the respondents who had no Internet access at home than on those who did have Internet access at home. See Table 6.24 for more findings.

Table 6.24: Moderation testing on Internet access at home.

Hypotheses	*Yes* *Estimate*	*p*	*No* *Estimate*	*p*	*z*-score
H1: USE <---BI	0.669	<.001	0.795	<.001	2.375**
H2: BI <---PU	0.208	<.001	0.28	<.001	1.443
H3: BI <---PEOU	0.267	<.001	0.336	<.001	1.823*
H4: PU <---PEOU	0.372	<.001	0.377	<.001	0.156
H5: BI <---SN	0.237	<.001	0.356	<.001	4.019***
H6: PU <---SN	0.176	<.001	0.07	0.097	-2.498**
H7: IMG <---SN	0.627	<.001	0.769	<.001	3.568***
H8: PU <---IMG	0.076	<.001	0.06	0.169	-0.372
H9: PU <---REL	0.371	<.001	0.354	<.001	-0.636
H10: PU <---RES	-0.042	<.001	0.032	0.206	2.843***
H11: PEOU <---CSE	0.061	<.001	0.046	0.045	-0.651
H12: PEOU <---PEC	0.625	<.001	0.79	<.001	4.895***
H13: PEOU <---CANX	-0.058	<.001	-0.041	0.13	0.578
H15: PEOU <---ENJ	0.276	<.001	0.155	<.001	-4.927***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10. H14 and H16 were removed from the model.

A significant positive moderating effect was reported on the effect of Perceived Ease of Use on Behavioural Intention, which led to the rejection of H17g and the conclusion that having Internet access at home will moderate the effect of Perceived Ease of Use on Behavioural Intention to use the Noor system. Internet access at work had no moderating role on the effect of Perceived Usefulness on Behavioural Intention. As a result, H17g was retained and it was concluded that having access to the Internet at home will not moderate the effect of Perceived Usefulness on Behavioural Intention to use the Noor system.

6.9. Internet Experience

Table 6.25: The fit indices measures; Internet Experience model

Model	CMIN/DF	*P*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Internet Experience	12.91	<.001	0.688	0.829	0.818	0.840	0.829	0.840	0.033	0.375

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Group= multigroup analysis for Internet Experience.

6.9.1. Internet Experience between less than 6 months and 6 months-12 months

Internet experience was reported to have a significant moderating role among the participants who had less than 6 months of Internet experience, and those who had between 6 and 12 months of Internet experience. Participants' Internet experience had a negative significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention; the effect was much weaker among those who had 6-12 months of Internet experience than among those who had less than 6 months of Internet experience. However, a significant positive effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention. The effect was much stronger among those who had 6-12 months of Internet experience than among those who had less than 6 months of Internet experience. See Table 6.26.

Table 6.26: Internet Experience between less than 6 months and 6 months-12 months

	Less than 6 months		6-12 months		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.634	<.001	0.719	<.001	0.766
H2: BI <---PU	0.281	<.001	0.019	0.826	-2.136**
H3: BI <---PEOU	0.181	<.001	0.389	<.001	2.461**
H4: PU <---PEOU	0.364	<.001	0.37	<.001	0.103
H5: BI <---SN	0.498	<.001	0.301	<.001	-2.933***
H6: PU <---SN	0.181	<.001	0.177	<.001	-0.066
H7: IMG <---SN	0.695	<.001	0.539	<.001	-1.721*
H8: PU <---IMG	-0.005	0.927	0.066	0.249	0.893
H9: PU <---REL	0.204	<.001	0.211	<.001	0.127
H10: PU <---RES	0.076	0.011	-0.037	0.377	-2.201**
H11: PEOU <---CSE	0.024	0.4	0.088	0.03	1.273
H12: PEOU <---PEC	0.921	<.001	0.693	<.001	-3.194***
H13: PEOU <---CANX	0.073	0.025	0.125	0.004	0.967
H15: PEOU <---ENJ	0.065	0.03	0.201	<.001	2.718***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.2. Internet Experience between 6 months-12months and 1-2 years

A significant negative moderating role was reported on the relationship between Perceived Ease of Use and Behavioural Intention, where the effect was much weaker among those who had 6-12 months of experience than among those with 1-2 years of Internet experience. Nevertheless, Internet experience was not found to have a moderating role on the relationship between Perceived Usefulness and Behavioural Intention. See Table 6.27.

Table 6.27: Internet Experience between 6 months-12months and 1-2 years

	6months-12 months		1-2 years		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.719	<.001	0.658	<.001	-0.529
H2: BI <---PU	0.019	0.826	0.198	0.012	1.51
H3: BI <---PEOU	0.389	<.001	0.183	<.001	-2.394**
H4: PU <---PEOU	0.37	<.001	0.284	<.001	-1.341
H5: BI <---SN	0.301	<.001	0.496	<.001	2.844***
H6: PU <---SN	0.177	<.001	0.146	0.001	-0.454
H7: IMG <---SN	0.539	<.001	0.709	<.001	1.843*
H8: PU <---IMG	0.066	0.249	0.049	0.312	-0.222
H9: PU <---REL	0.211	<.001	0.286	<.001	1.417
H10: PU <---RES	-0.037	0.377	0.038	0.17	1.495
H11: PEOU <---CSE	0.088	0.03	0.045	0.145	-0.851
H12: PEOU <---PEC	0.693	<.001	0.752	<.001	0.813
H13: PEOU <---CANX	0.125	0.004	0	0.987	-2.369**
H15: PEOU <---ENJ	0.201	<.001	0.219	<.001	0.369

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.3. Internet Experience between 1-2 years and 2-3 years

A significant positive moderating role was reported on the relationship between Perceived Ease of Use and Behavioural Intention. In this instance, the effect was stronger among those with 2-3 years of experience than among the participants with only 1-2 years of Internet experience. However, Internet experience was not found to have any moderating role on the relationship between Perceived Usefulness and Behavioural Intention. See Table 6.28.

Table 6.28: Internet Experience between 1-2 years and 2-3 years

Hypotheses	1-2 years Estimate	*p*	2-3 years Estimate	*p*	*z*-score
H1: USE <---BI	0.658	<.001	0.714	<.001	0.639
H2: BI <---PU	0.198	0.012	0.171	0.004	-0.28
H3: BI <---PEOU	0.183	<.001	0.365	<.001	2.542**
H4: PU <---PEOU	0.284	<.001	0.41	<.001	2.46**
H5: BI <---SN	0.496	<.001	0.244	<.001	-4.37***
H6: PU <---SN	0.146	0.001	0.105	0.011	-0.657
H7: IMG <---SN	0.709	<.001	0.691	<.001	-0.232
H8: PU <---IMG	0.049	0.312	0.061	0.158	0.182
H9: PU <---REL	0.286	<.001	0.279	<.001	-0.175
H10: PU <---RES	0.038	0.17	-0.019	0.502	-1.441
H11: PEOU <---CSE	0.045	0.145	0.052	0.046	0.178
H12: PEOU <---PEC	0.752	<.001	0.795	<.001	0.681
H13: PEOU <---CANX	0	0.987	0.054	0.04	1.357
H15: PEOU <---ENJ	0.219	<.001	0.166	<.001	-1.398

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.4. Internet Experience between 2-3 years and 3-4 years

Internet experience had no significant moderating role on the relationship between Perceived Usefulness and Behavioural Intention, or on the relationship between Perceived Ease of Use on Behavioural Intention among participants with 2-3 years and 3-4 years of Internet experience. See Table 6.29.

Table 6.29: Internet Experience between 2-3 years and 3-4 years

Hypotheses	2-3 years Estimate	*p*	3-4 years Estimate	*p*	*z*-score
H1: USE <---BI	0.714	<.001	0.727	<.001	0.171
H2: BI <---PU	0.171	0.004	0.149	<.001	-0.312
H3: BI <---PEOU	0.365	<.001	0.418	<.001	0.917
H4: PU <---PEOU	0.41	<.001	0.356	<.001	-1.198
H5: BI <---SN	0.244	<.001	0.193	<.001	-1.234
H6: PU <---SN	0.105	0.011	0.202	<.001	1.992**
H7: IMG <---SN	0.691	<.001	0.649	<.001	-0.7
H8: PU <---IMG	0.061	0.158	0.095	<.001	0.665
H9: PU <---REL	0.279	<.001	0.368	<.001	2.563**
H10: PU <---RES	-0.019	0.502	-0.094	<.001	-2.163**
H11: PEOU <---CSE	0.052	0.046	0.089	<.001	1.06
H12: PEOU <---PEC	0.795	<.001	0.65	<.001	-2.737***
H13: PEOU <---CANX	0.054	0.04	0.077	<.001	0.707
H15: PEOU <---ENJ	0.166	<.001	0.238	<.001	2.317**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.5. Internet Experience between 3-4 years and 4-8 years

With regard to the 3-4 years' and 4-8 years' experience categories, Internet experience was found to have a significant positive moderating effect on the relationship between Perceived Usefulness and Behavioural Intention. This effect was much stronger among those with 4-8 years' experience than for those with 3-4 years of Internet experience. However, a negative moderation was reported on the relationship between Perceived Ease of Use on Behavioural Intention, where the effect was significantly weaker among those who had 4-8 years of experience than among those with 3-4 years of experience. See Table 6.30.

Table 6.30: Internet Experience between 3-4 years and 4-8 years

Hypotheses	3-4 years Estimate	*p*	4-8 years Estimate	*p*	*z*-score
H1: USE <---BI	0.727	<.001	0.542	<.001	-3.788***
H2: BI <---PU	0.149	<.001	0.221	<.001	1.668*
H3: BI <---PEOU	0.418	<.001	0.279	<.001	-3.611***
H4: PU <---PEOU	0.356	<.001	0.319	<.001	-1.211
H5: BI <---SN	0.193	<.001	0.224	<.001	1.094
H6: PU <---SN	0.202	<.001	0.168	<.001	-1.139
H7: IMG <---SN	0.649	<.001	0.616	<.001	-0.821
H8: PU <---IMG	0.095	<.001	0.083	<.001	-0.368
H9: PU <---REL	0.368	<.001	0.388	<.001	0.82
H10: PU <---RES	-0.094	<.001	-0.046	0.001	1.923*
H11: PEOU <---CSE	0.089	<.001	0.063	<.001	-0.969
H12: PEOU <---PEC	0.65	<.001	0.627	<.001	-0.711
H13: PEOU <---CANX	0.077	<.001	0.074	<.001	-0.146
H15: PEOU <---ENJ	0.238	<.001	0.238	<.001	0.027

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.6. Internet Experience between 4-8 years and 8-12 years

Internet experience had no significant moderating effect on the relationship between Perceived Usefulness and Perceived Ease of Use on Behavioural Intention among the respondents in the 4-8 years and 8-12 years categories. See Table 6.31.

Table 6.31: Internet Experience between 4-8 years and 8-12 years

Hypotheses	4-8 years Estimate	*p*	8-12 years Estimate	*p*	*z*-score
H1: USE <---BI	0.542	<.001	0.567	<.001	0.686
H2: BI <---PU	0.221	<.001	0.21	<.001	-0.324
H3: BI <---PEOU	0.279	<.001	0.236	<.001	-1.472
H4: PU <---PEOU	0.319	<.001	0.369	<.001	2.094**
H5: BI <---SN	0.224	<.001	0.231	<.001	0.346
H6: PU <---SN	0.168	<.001	0.146	<.001	-0.918
H7: IMG <---SN	0.616	<.001	0.597	<.001	-0.632
H8: PU <---IMG	0.083	<.001	0.053	0.004	-1.227
H9: PU <---REL	0.388	<.001	0.423	<.001	1.755*
H10: PU <---RES	-0.046	0.001	-0.016	0.294	1.456
H11: PEOU <---CSE	0.063	<.001	0.074	<.001	0.599
H12: PEOU <---PEC	0.627	<.001	0.604	<.001	-0.914
H13: PEOU <---CANX	0.074	<.001	0.053	0.002	-0.957
H15: PEOU <---ENJ	0.238	<.001	0.278	<.001	2.243**

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.9.7. Internet Experience between 8-12 years and more than 12 years

Internet experience had no significant moderating effect on the relationship between Perceived Usefulness and Perceived Ease of Use on Behavioural Intention among the respondents who had 8-12 years' experience or among those with more than 12 years of Internet experience. See Table 6.32.

Table 6.32: Internet Experience between 8-12 years and more than 12 years

Hypotheses	8-12 years Estimate	*p*	More than 12 years Estimate	*p*	*z*-score
H1: USE <---BI	0.567	<.001	0.499	<.001	-2.241**
H2: BI <---PU	0.21	<.001	0.236	<.001	0.878
H3: BI <---PEOU	0.236	<.001	0.237	<.001	0.06
H4: PU <---PEOU	0.369	<.001	0.393	<.001	1.17
H5: BI <---SN	0.231	<.001	0.258	<.001	1.354
H6: PU <---SN	0.146	<.001	0.173	<.001	1.293
H7: IMG <---SN	0.597	<.001	0.634	<.001	1.463
H8: PU <---IMG	0.053	0.004	0.076	<.001	1.006
H9: PU <---REL	0.423	<.001	0.37	<.001	-3.033***
H10: PU <---RES	-0.016	0.294	-0.033	<.001	-0.959
H11: PEOU <---CSE	0.074	<.001	0.055	<.001	-1.183
H12: PEOU <---PEC	0.604	<.001	0.591	<.001	-0.614
H13: PEOU <---CANX	0.053	0.002	0.048	<.001	-0.208
H15: PEOU <---ENJ	0.278	<.001	0.322	<.001	2.798***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

The moderating role of Internet Experience on the effect of Perceived Usefulness on Behavioural Intention had a significant negative effect when the participants were still new users of the system; this led to the rejection of H17h. However, as experience increases, no moderating effect is observed until the participants attain higher levels of experience. Thus, it was concluded that Internet Experience will have a negative moderating effect on new users of the Noor system, although this effect will diminish over time. With regard to the effect of Perceived Ease of Use on Behavioural Intention, H17h was rejected and it was concluded that Internet Experience will have a significant and positive moderating role on the effect of Perceived Ease of Use on Behavioural Intention among new Noor users, but the moderating effect will become significantly weaker as the participants gain more Internet experience.

6.10. Age

Age is one of the most widely investigated socio-demographics in many studies. In this section, age has been investigated as a possible moderator in TAM 3. The age category was different for the students than for the teachers and the parents. The maximum age for the students was 18 years, but the highest age category for the parents and the teachers was over 55 years. The relative fit indices on age are shown on Table 6.33.

Table 6.33: Fit indices measures on Age

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Age	11.71	<.001	0.685	0.829	0.818	0.841	0.830	0.841	0.032	0.409

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Group= multigroup analysis for Age.

6.10.1. Age between less than 15 years and 15-16 years

There was no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention. However, in the case of the relationship between Perceived Ease of Use and Behavioural Intention, age had a significant positive moderating effect. The moderating effect was much stronger for participants belonging to the 15-16 years age category than for participants under the age of 15. See Table 6.34 for more details.

Table 6.34: Age between less than 15 years and 15-16 years

	Less than 15		15-16		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.668	<.001	0.533	<.001	-1.717*
H2: BI <---PU	0.111	0.142	0.217	<.001	1.171
H3: BI <---PEOU	0.202	0.001	0.374	<.001	2.231**
H4: PU <---PEOU	0.543	<.001	0.228	<.001	-5.45***
H5: BI <---SN	0.453	<.001	0.237	<.001	-3.683***
H6: PU <---SN	0.253	<.001	0.152	<.001	-1.668*
H7: IMG <---SN	0.628	<.001	0.513	<.001	-1.571
H8: PU <---IMG	-0.028	0.599	0.134	<.001	2.483**
H9: PU <---REL	0.23	<.001	0.365	<.001	3.113***
H10: PU <---RES	-0.128	<.001	0.053	0.092	3.659***
H11: PEOU <---CSE	0.008	0.795	0.126	<.001	2.653***
H12: PEOU <---PEC	0.787	<.001	0.627	<.001	-2.576**
H13: PEOU <---CANX	0.023	0.49	0.062	0.038	0.891
H15: PEOU <---ENJ	0.223	<.001	0.201	<.001	-0.541

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.2. Age between 15-16 years and 16-17 years

No significant moderating effect was observed for the 15-16 years and the 16-17 years age categories. See Table 6.35 for more details.

Table 6.35: Age between 15-16 years and 16-17 years

	15-16 years		16-17 years		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.533	<.001	0.582	<.001	0.779
H2: BI <---PU	0.217	<.001	0.308	<.001	1.331
H3: BI <---PEOU	0.374	<.001	0.309	<.001	-1.071
H4: PU <---PEOU	0.228	<.001	0.264	<.001	0.767
H5: BI <---SN	0.237	<.001	0.211	<.001	-0.61
H6: PU <---SN	0.152	<.001	0.176	<.001	0.552
H7: IMG <---SN	0.513	<.001	0.583	<.001	1.299
H8: PU <---IMG	0.134	<.001	0.101	<.001	-0.691
H9: PU <---REL	0.365	<.001	0.344	<.001	-0.56
H10: PU <---RES	0.053	0.092	-0.003	0.908	-1.408
H11: PEOU <---CSE	0.126	<.001	0.085	<.001	-1.041
H12: PEOU <---PEC	0.627	<.001	0.583	<.001	-0.813
H13: PEOU <---CANX	0.062	0.038	0.141	<.001	2.024**
H15: PEOU <---ENJ	0.201	<.001	0.257	<.001	1.606

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.3. Age between 16-17 years and 17-18 years

No significant moderating effect was observed in either the 16-17 years or the 17-18 years age categories. See Table 6.36 for more details. Thus, it was concluded that age had no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention (H2), or on the relationship between Perceived Ease of Use and Behavioural Intention (H3) among the students. However, age had a significant moderating effect on the other relationships, as shown in Table 6.34, although the focus of this section was restricted to H2 and H3.

Table 6.36: Age between 16-17 years and 17-18 years

	16-17 years		17-18 years		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.582	<0.001	0.616	<0.001	0.567
H2: BI <---PU	0.308	<0.001	0.224	<0.001	-1.394
H3: BI <---PEOU	0.309	<0.001	0.338	<0.001	0.548
H4: PU <---PEOU	0.264	<0.001	0.237	<0.001	-0.685
H5: BI <---SN	0.211	<0.001	0.242	<0.001	0.796
H6: PU <---SN	0.176	<0.001	0.148	<0.001	-0.701
H7: IMG <---SN	0.583	<0.001	0.643	<0.001	1.182
H8: PU <---IMG	0.101	<0.001	0.101	<0.001	-0.004
H9: PU <---REL	0.344	<0.001	0.445	<0.001	2.971***
H10: PU <---RES	-0.003	0.908	-0.001	0.961	0.052
H11: PEOU <---CSE	0.085	<0.001	0.133	<0.001	1.366
H12: PEOU <---PEC	0.583	<0.001	0.62	<0.001	0.798
H13: PEOU <---CANX	0.141	<0.001	0.06	0.02	-2.274**
H15: PEOU <---ENJ	0.257	<0.001	0.201	<0.001	-1.78*

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.4. Age between 18-25 years and 25-35 years

Among the adults, age had a significant moderating effect, particularly in the 18-25 and 25-35 age brackets. Age had a significant positive moderating effect on the relationship between Perceived Usefulness and Behavioural Intention, where the effect was much stronger among the participants in the 25-35 years age bracket. A weaker effect was reported on the moderating effect of age on the relationship between Perceived Ease of Use and Behavioural Intention; this effect was much weaker among participants aged 25-35 years than among participants who were between 18 and 25 years of age. See Table 6.37.

Table 6.37: Age between 18-25 years and 25-35 years

	18-25 years		25-35 years		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.657	<.001	0.543	<.001	-3.031***
H2: BI <---PU	0.12	<.001	0.209	<.001	2.172**
H3: BI <---PEOU	0.381	<.001	0.297	<.001	-2.507**
H4: PU <---PEOU	0.329	<.001	0.467	<.001	5.483***
H5: BI <---SN	0.314	<.001	0.254	<.001	-2.406**
H6: PU <---SN	0.228	<.001	0.158	<.001	-2.591***
H7: IMG <---SN	0.676	<.001	0.655	<.001	-0.671
H8: PU <---IMG	0.05	0.024	0.058	0.003	0.263
H9: PU <---REL	0.361	<.001	0.34	<.001	-1.02
H10: PU <---RES	-0.081	<.001	-0.059	<.001	1.114
H11: PEOU <---CSE	0.054	<.001	0.052	<.001	-0.095
H12: PEOU <---PEC	0.728	<.001	0.678	<.001	-1.912*
H13: PEOU <---CANX	0.066	<.001	0.047	0.003	-0.851
H15: PEOU <---ENJ	0.183	<.001	0.275	<.001	5.065***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.5. Age between 25-35 years and 35-45 years

In the 25-35 years and 35-45 years age categories, age was not found to have a significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention (H2), or on the relationship between Perceived Ease of Use and Behavioural Intention (H3). See Table 6.38.

Table 6.38: Age between 25-35 years and 35-45 years

Hypotheses	25-35 years Estimate	*p*	35-45 years Estimate	*p*	*z*-score
H1: USE <---BI	0.543	<.001	0.55	<.001	0.229
H2: BI <---PU	0.209	<.001	0.191	<.001	-0.528
H3: BI <---PEOU	0.297	<.001	0.257	<.001	-1.361
H4: PU <---PEOU	0.467	<.001	0.381	<.001	-3.833***
H5: BI <---SN	0.254	<.001	0.224	<.001	-1.463
H6: PU <---SN	0.158	<.001	0.193	<.001	1.554
H7: IMG <---SN	0.655	<.001	0.624	<.001	-1.106
H8: PU <---IMG	0.058	0.003	0.062	<.001	0.168
H9: PU <---REL	0.34	<.001	0.358	<.001	1
H10: PU <---RES	-0.059	<.001	-0.019	0.097	2.253**
H11: PEOU <---CSE	0.052	<.001	0.06	<.001	0.435
H12: PEOU <---PEC	0.678	<.001	0.514	<.001	-7.689***
H13: PEOU <---CANX	0.047	0.003	0.044	<.001	-0.157
H15: PEOU <---ENJ	0.275	<.001	0.386	<.001	6.933***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.6. Age between 35-45 years and 45-55 years

There was no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention (H2), or that between Perceived Ease of Use and Behavioural Intention (H3) among participants in the 35-45 years and 45-55 years age brackets. See Table 6.39.

Table 6.39: Age between 35-45 years and 45-55 years

	35-45 years		45-55 years		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.55	<.001	0.487	<.001	-1.941*
H2: BI <---PU	0.191	<.001	0.172	<.001	-0.551
H3: BI <---PEOU	0.257	<.001	0.229	<.001	-0.909
H4: PU <---PEOU	0.381	<.001	0.47	<.001	3.747***
H5: BI <---SN	0.224	<.001	0.189	<.001	-1.559
H6: PU <---SN	0.193	<.001	0.103	<.001	-3.644***
H7: IMG <---SN	0.624	<.001	0.616	<.001	-0.262
H8: PU <---IMG	0.062	<.001	0.071	0.001	0.351
H9: PU <---REL	0.358	<.001	0.365	<.001	0.351
H10: PU <---RES	-0.019	0.097	-0.066	<.001	-2.295**
H11: PEOU <---CSE	0.06	<.001	0.064	<.001	0.242
H12: PEOU <---PEC	0.514	<.001	0.622	<.001	4.783***
H13: PEOU <---CANX	0.044	<.001	0.063	<.001	0.842
H15: PEOU <---ENJ	0.386	<.001	0.32	<.001	-3.761***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.10.7. Age between 45-55 years, and more than 55 years

As for participants aged between 45 and 55, and those over the age of 55, age was found to have a significant moderating effect. The moderating effect on Perceived Usefulness and Behavioural Intention was strong, and the effect was much stronger for the participants who were over the age of 55 years than for those belonging to the 45-55 years age category. However, the moderating effect on Perceived Ease of Use and Behavioural Intention was weakest, and the effect was much weaker among those in the 45-55 years age bracket than among participants over the age of 55. Thus, it was concluded that age only had a significant moderating effect on H2 and H3 for participants in the 45-55 years, and more than 55 years age brackets. See Table 6.40.

Table 6.40: Age between 45-55 years, and more than 55 years

	45-55		More than 55		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.487	<.001	0.518	<.001	0.388
H2: BI <---PU	0.172	<.001	0.346	<.001	1.922*
H3: BI <---PEOU	0.229	<.001	0.043	0.482	-2.83***
H4: PU <---PEOU	0.47	<.001	0.425	<.001	-0.989
H5: BI <---SN	0.189	<.001	0.253	<.001	1.255
H6: PU <---SN	0.103	<.001	0.065	0.172	-0.732
H7: IMG <---SN	0.616	<.001	0.615	<.001	-0.021
H8: PU <---IMG	0.071	0.001	0.19	<.001	1.926*
H9: PU <---REL	0.365	<.001	0.353	<.001	-0.285
H10: PU <---RES	-0.066	<.001	-0.028	0.466	0.932
H11: PEOU <---CSE	0.064	<.001	0.044	0.246	-0.508
H12: PEOU <---PEC	0.622	<.001	0.797	<.001	3.251***
H13: PEOU <---CANX	0.063	<.001	0.037	0.427	-0.514
H15: PEOU <---ENJ	0.32	<.001	0.029	0.448	-7.188***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

Among the students, age had no moderating effect on the effect of Perceived Usefulness on Behavioural Intention, so H17i was retained. However, age had a significant moderating role on the effect of Perceived Ease of Use on Behavioural Intention among the mid school goers, leading to the rejection of H17i. However, this led to the conclusion that age had a significant positive moderating effect on the effect of Perceived Ease of Use on Behavioural Intention among the mid school goers, although this effect will diminish as they get older.

With regard to the parents and the teachers, age was found to have a significant positive moderating role among the younger population on the relationship between Perceived Usefulness and Behavioural Intention, leading to the rejection of H17i. This led to the conclusion that age will have a positive and significant moderating role among the younger age groups. Although the effect will diminish as their age increases, it will become strong as they approach retirement age. H17i was also rejected due to the effect of Perceived Ease of Use on Behavioural Intention. It was, therefore, concluded that age will have a significant negative moderating effect among the younger population, where its effect will diminish with increasing age, but will reappear again to be significantly negative as one approaches retirement age.

6.11. Educational Level

Table 6.41: Fit indices measures on Educational Level model

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Educational Level model	10.39	<.001	0.677	0.824	0.812	0.838	0.827	0.838	0.037	0.409

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation, SRMR= Standardised Root Mean Residual. Group= multigroup analysis for Educational Level model

6.11.1. Education Level between intermediate school and secondary school

For participants in intermediate and secondary schools, education level had significant negative moderating effect on the relationship between Perceived Usefulness and Behavioural Intention. This effect was much weaker among the participants who had a secondary level of education than among those who only had an intermediate level of education. The effect on Perceived Ease of Use and Behavioural Intention was not significant. See Table 6.42.

Table 6.42: Education Level between intermediate school, and secondary school

Hypotheses	Intermediate school Estimate	*p*	Secondary school Estimate	*P*	*z*-score
H1: USE <---BI	0.708	<.001	0.644	<.001	-0.544
H2: BI <---PU	0.576	<.001	0.252	0.005	-2.489**
H3: BI <---PEOU	0.09	0.19	0.238	<.001	1.563
H4: PU <---PEOU	0.448	<.001	0.441	<.001	-0.097
H5: BI <---SN	0.317	<.001	0.253	<.001	-1.019
H6: PU <---SN	-0.109	0.056	0.134	<.001	3.743***
H7: IMG <---SN	0.738	<.001	0.67	<.001	-0.679
H8: PU <---IMG	0.031	0.591	-0.036	0.232	-1.032
H9: PU <---REL	0.42	<.001	0.284	<.001	-2.525**
H10: PU <---RES	-0.019	0.585	-0.038	0.142	-0.432
H11: PEOU <---CSE	0.016	0.476	0.004	0.884	-0.362
H12: PEOU <---PEC	0.913	<.001	0.786	<.001	-1.492
H13: PEOU <---CANX	0.047	0.149	0.028	0.294	-0.454
H15: PEOU <---ENJ	0.195	<.001	0.212	<.001	0.397

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.11.2. Education Level between secondary school and diploma degree

When comparing secondary school and the diploma degree, education level had no significant moderating effect on the relationship between Perceived Usefulness and Behavioural Intention, or on that between and Perceived Ease of Use and Behavioural Intention. See Table 6.43.

Table 6.43: Education Level between secondary school, and diploma degree

	Secondary school		Diploma Degree		
Hypotheses	Estimate	*p*	Estimate	*p*	*z*-score
H1: USE <---BI	0.644	<.001	0.686	<.001	0.593
H2: BI <---PU	0.252	0.005	0.216	<.001	-0.376
H3: BI <---PEOU	0.238	<.001	0.297	<.001	0.839
H4: PU <---PEOU	0.441	<.001	0.373	<.001	-1.664*
H5: BI <---SN	0.253	<.001	0.198	<.001	-1.258
H6: PU <---SN	0.134	<.001	0.141	<.001	0.202
H7: IMG <---SN	0.67	<.001	0.614	<.001	-0.891
H8: PU <---IMG	-0.036	0.232	0.006	0.766	1.164
H9: PU <---REL	0.284	<.001	0.344	<.001	1.867*
H10: PU <---RES	-0.038	0.142	-0.057	<.001	-0.642
H11: PEOU <---CSE	0.004	0.884	0.062	<.001	1.91*
H12: PEOU <---PEC	0.786	<.001	0.663	<.001	-2.594***
H13: PEOU <---CANX	0.028	0.294	0.039	0.011	0.361
H15: PEOU <---ENJ	0.212	<.001	0.271	<.001	1.852*

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.11.3. Education Level between diploma degree and bachelor degree

When comparing respondents who had a diploma degree with those who had a bachelor’s degree, education level was observed to have a significant negative moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention, and this effect was much weaker among participants who were educated to bachelor’s degree level. However, in the case of the relationship between Perceived Usefulness and Behavioural Intention, participants’ level of education had no significant moderating effect. See Table 6.44.

Table 6.44: Education Level between diploma degree, and bachelor degree

Hypotheses	Diploma degree Estimate	*p*	Bachelor degree Estimate	*p*	*z*-score
H1: USE <---BI	0.686	<.001	0.477	<.001	-5.119***
H2: BI <---PU	0.216	<.001	0.273	<.001	1.283
H3: BI <---PEOU	0.297	<.001	0.23	<.001	-1.922*
H4: PU <---PEOU	0.373	<.001	0.493	<.001	4.729***
H5: BI <---SN	0.198	<.001	0.241	<.001	1.809*
H6: PU <---SN	0.141	<.001	0.158	<.001	0.687
H7: IMG <---SN	0.614	<.001	0.619	<.001	0.143
H8: PU <---IMG	0.006	0.766	0.077	<.001	2.768***
H9: PU <---REL	0.344	<.001	0.266	<.001	-3.759***
H10: PU <---RES	-0.057	<.001	-0.027	0.038	1.49
H11: PEOU <---CSE	0.062	<.001	0.055	<.001	-0.309
H12: PEOU <---PEC	0.663	<.001	0.665	<.001	0.084
H13: PEOU <---CANX	0.039	0.011	0.038	0.012	-0.049
H15: PEOU <---ENJ	0.271	<.001	0.289	<.001	0.944

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.11.4. Education Level between master's degree and PhD

When comparing the respondents who had master's degrees with those who held a PhD, education level did not appear to have any moderating role on the relationship between Perceived Usefulness and Perceived Ease of Use on Behavioural Intention. See Table 6.45.

Table 6.45: Education Level between master degree, and PhD

Hypotheses	Master degree Estimate	p	PhD Estimate	p	z-score
H1: USE <---BI	0.508	<.001	0.377	<.001	-2.858***
H2: BI <---PU	0.168	<.001	0.165	<.001	-0.058
H3: BI <---PEOU	0.251	<.001	0.23	<.001	-0.426
H4: PU <---PEOU	0.368	<.001	0.398	<.001	0.708
H5: BI <---SN	0.231	<.001	0.199	<.001	-0.798
H6: PU <---SN	0.157	<.001	0.183	<.001	0.594
H7: IMG <---SN	0.629	<.001	0.538	<.001	-1.976**
H8: PU <---IMG	0.084	<.001	0.076	0.101	-0.157
H9: PU <---REL	0.423	<.001	0.386	<.001	-1.137
H10: PU <---RES	-0.023	0.099	-0.079	0.02	-1.534
H11: PEOU <---CSE	0.064	<.001	0.095	0.001	0.982
H12: PEOU <---PEC	0.504	<.001	0.514	<.001	0.262
H13: PEOU <---CANX	0.074	<.001	0	0.998	-1.452
H15: PEOU <---ENJ	0.388	<.001	0.359	<.001	-0.929

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

6.11.5. Education Level between PhD and Other

Likewise, Table 6.46 did not show any significant moderating effect on H2 and H3. Therefore, it was concluded that education only had a significant negative moderating role in the relationship between Perceived Usefulness and Behavioural Intention when comparing participants with intermediate or secondary school levels of education. Other levels of educational attainment did not have a significant moderating effect on H2. As for the moderating effect on Perceived Ease of Use, it was concluded that the effect was significantly negative only among the diploma degree and bachelor’s degree holders. For the rest of H3, education levels had insignificant moderating effects.

Table 6.46: Education Level between PhD, and Other

Hypotheses	PhD Estimate	*p*	Other Estimate	*p*	*z*-score
H1: USE <---BI	0.377	<.001	0.375	<.001	-0.023
H2: BI <---PU	0.165	<.001	0.184	0.01	0.222
H3: BI <---PEOU	0.23	<.001	0.243	<.001	0.157
H4: PU <---PEOU	0.398	<.001	0.087	0.16	-4.241***
H5: BI <---SN	0.199	<.001	0.157	0.022	-0.53
H6: PU <---SN	0.183	<.001	0.118	0.164	-0.699
H7: IMG <---SN	0.538	<.001	0.601	<.001	0.735
H8: PU <---IMG	0.076	0.101	-0.058	0.551	-1.245
H9: PU <---REL	0.386	<.001	0.673	<.001	4.012***
H10: PU <---RES	-0.079	0.02	0.135	0.04	2.89***
H11: PEOU <---CSE	0.095	0.001	0.046	0.421	-0.774
H12: PEOU <---PEC	0.514	<.001	0.205	0.003	-3.999***
H13: PEOU <---CANX	0	0.998	0.089	0.371	0.803
H15: PEOU <---ENJ	0.359	<.001	0.653	<.001	3.786***

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. *** *p-value* < 0.01; ** p-value < 0.05; * p-value < 0.10. H14 and H16 were removed from the model.

Education level was found to have a significant negative moderating effect on the relationship between Perceived Usefulness and Behavioural Intention. This prompted the rejection of H17j and led to the conclusion that the influence of Perceived Usefulness on Behavioural Intention to use the Noor system will be negatively moderated by education level among the participants who have a lower level of education and, as their level of education increases, its effect will diminish completely. With regard to the influence of Perceived Usefulness on Behavioural Intention, education level was reported to have a weak moderating effect only among those who held diplomas or master's degrees. This led to the rejection of H17j and the conclusion that the influence of Perceived Ease of Use on Behavioural Intention to use the Noor system will be moderated by educational level only among diploma and master's degree holders.

6.12. Moderation Interaction

The moderating interactions using the Noor system study were also investigated; these comprised both two-way and three-way interactions. In this section, 12 interactions (hypotheses) were investigated as outlined in Figure 3-1. The following hypotheses were investigated in this section: H3a, H4a, H5a, H5b, H5c, H5d, H5e, H5f, H6a, H9a, H13a, and H15a.

The standardised z score values for the 14 constructs were run, together with the standardised z score values for Voluntariness (which had three items), and Noor Experience, which was measured in the form of a categorical scale. The data for performing the moderating interactions were then transformed using SPSS version 22 and their respective new variables that were supposed to run the analysis were computed. Table 11.1 in Appendix A shows the comparative findings for the interactions among the three groups used in the study. The general results from the full dataset showed the following moderating interactions had no significant effects. These were H13a (Computer Anxiety X Experience) →Perceived Ease of Use, H9a (Job Relevance X Output Quality) →Perceived Usefulness, H4a (Perceived Ease of Use X Experience) →Perceived Usefulness and H15a (Perceived Enjoyment X Experience) → Perceived Ease of Use. However, H3a, H5a, H5b, and H6a had significant effects. The moderating interactions were also run on the separate groups. In the teachers' model, the two-way interaction (Subjective Norm X Experience) had a positive significant effect on Behavioural Intention, while the parents and the students models had negative significant effects. The interaction on the teachers' model was in a mandatory setting. See Table 11.1 in Appendix A for the respective parameter estimates and the respective *p* values.

The students' model also had some significant interactions. It had a significant positive effect (Perceived Ease of Use X Experience) on Behavioural Intention, a significant negative (Subjective Norm X Experience) effect on Behavioural Intention, a significant negative (Subjective Norm X Voluntariness) effect on Behavioural Intention, a significant negative (Perceived Ease of Use X Experience) effect on Perceived Usefulness, and a significant positive

(Subjective Norm X Experience) effect on Perceived Usefulness. These interactions were significant in a voluntary setting. See Table 11.1 in Appendix A for the respective parameter estimates and the respective *p* values.

The parents' model had seven significant moderating interactions, which were significant in a voluntary setting. The negative interactions were on the effects of (Perceived Enjoyment X Experience) on Perceived Ease of Use, of (Subjective Norm X Experience) on Behavioural Intention, of Perceived Ease of Use X Experience) on Perceived Usefulness, and of (Subjective Norm X Voluntariness) on Behavioural Intention. Similarly, there was a significant positive effect (Subjective Norm X Experience) on Perceived Usefulness; (Perceived Ease of Use X Experience) on Behavioural Intention, and (Subjective Norm X Voluntariness X Experience) on Behavioural Intention. See Table 11.1 in Appendix A for the relevant parameter estimates and the respective *p* values.

6.13. Conclusion

In Chapter 6, all of the relationships outlined in Chapter 3 were presented. The analysis presented was performed using AMOS. The hypotheses were performed using the Maximum Likelihood Estimation method. The findings have been presented in the form of *p* values and the *z*-score signage. All *p* values lower than 0.05 were considered significant, and those above 0.05 were considered to be insignificant. When interpreting the statistics presented in the tables, it is very important to first assess the signage of the value. Any significant value that has a negative *Beta* estimate indicates that the relationship under investigation has a weak effect, while a positive value represents a strong effect. However, the levels of these effects have been categorised into three groups, depending on the number of asterisks that are embedded on their *z*-score values. For example, a positive significant *z*-score with three asterisk represents the strongest effect, two asterisks represent a stronger effect, while one asterisk represents a strong effect. With regard to the significant negative *z*-scores, three asterisks represent the weakest effect, two asterisks represent a weaker effect, while one asterisk represents a weak effect.

Similarly, the moderation testing findings on chosen demographics are presented based on the samples of teachers, parents, and students. Their interpretation is similar to the one described in the paragraph above. Comparative findings on the Noor system study are also being presented. This has been achieved by comparing the findings of the Noor study on Perceived Ease of Use, Perceived Usefulness, Image, Behavioural Intention, and Use Behaviour with studies conducted by Al-Gahtani (2016) and Venkatesh and Bala (2008).

Finally, a number of laid down procedures and processes have been followed before the reporting of the Structural Equation Modelling results. These have been reviewed in Chapter 5. It was very important to assess the relative fit indices for the models that have been presented in this chapter. It is worth mentioning that this study encountered some slight issues regarding the normality test of the data. This was first assessed by plotting histograms, and by assessing the basic descriptive statistics. However, based on the massive data set that was collected for this study $N = 10{,}711$, and based on studies conducted by Wang et al. (1996); Schermelleh-Engel et al. (2003), it was agreed that we would proceed with the analysis because large sample sizes reduce the sampling error in the study, thereby generating results that have better parameter estimates when compared with studies that have adopted small sample sizes. Likewise, an Excel master sheet cleaner based on Gaskins' (2015) macro was developed. The data was assessed for unengaged responses. However, the deletion of the unengaged responses had a negligible effect on the normality of the data. Thus, it was deemed appropriate to retain the entire data set for the final analysis. Finally, in the following chapter, an attempt will be made to interpret the massive results outlined in Chapter 6 using simple language. These findings are very interesting, given that the study compared Saudis and non-Saudis. The two groups in some hypotheses expressed different views. This implies that a number of cultural differences exist. Moreover, the two groups exhibit some similarities and differences in some hypotheses that have been interpreted according to whether the setting is voluntary or mandatory.

7 CHAPTER SEVEN: THE IMPORTANCE OF THE USE BEHAVIOUR CONSTRUCT IN THE TECHNOLOGY ACCEPTANCE MODEL 3

7.1. Introduction

In this section, an attempt will be made to investigate studies that have been conducted using the TAM 3. The findings from these studies will be compared with the findings from the Noor system after the removal of the Use Behaviour construct. According to the literature, it is only relevant to measure the Use Behaviour construct when the system has been in use, and it is not appropriate to estimate the Use Behaviour construct when the system is new. Therefore, several studies will be reviewed in accordance with the predefined criteria. Firstly, the study must have been conducted using the TAM 3. Secondly, the study must have used Behavioural Intention as its dependent variable. Thirdly, the study must have used Perceived Ease of Use and Perceived Usefulness as its main constructs. Therefore, three hypotheses will be reviewed, namely Perceived Ease of Use on Behavioural Intention (H2), Perceived Usefulness on Behavioural Intention (H3), and Perceived Ease of Use on Perceived Usefulness (H4). Finally, the studies must have been cross-sectional. Studies that failed to meet this criterion were not appraised for comparative purposes.

It is often stated that the lesser the number of items, the lower the Cronbach's alpha value, and, when the number of items is increased, the Cronbach's reliability value also increases. This statement confirms that the Cronbach's reliability alpha value is dependent on the number of items under investigation. In the current study, the construct of Use Behaviour was eventually removed from the final model, so Behavioural Intention can be estimated as the main dependent variable. Just as it has been postulated above regarding the Cronbach's alpha value, it was anticipated that removing the Use Behaviour construct would cause the variance explained by Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness to either increase or decrease. Thus, it was deemed appropriate to remove the construct of Use Behaviour from the main model to measure the effect it has on Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness. These findings are expected to contribute to the knowledge gap regarding the importance of retaining the Use Behaviour construct when studying an information system that has been in use.

The following section discusses the effect of removing the Use Behaviour construct on the relative fit indices, the effect on the standardised regression weights, and the effect on the explained variance (the R-squared values).

7.2. The Comparative fit Indices

The overall model, the teachers' model, the students' model, and the parents' model were all assessed for their goodness of fit. The most surprising thing was that, upon the removal of the Use Behaviour construct from the final model, the CMIN/DF values for the four models increased. The increases were as follows: the overall model (92.20 → 100.46), the teachers' model (14.91→ 16.28), the students' model (31.32 → 34.62), and the parents' model (50.96 → 55.46). Thus, it was concluded that, following the removal of the Use Behaviour construct from the final model, the CMIN/DF values would increase.

With regard to the *p* values, all values were significant at less than 0.001 for both the model containing the Use Behaviour construct, and the model without the Use Behaviour construct. The values for the goodness-of-fit index were compared for the two models. The findings were as follows: the overall model (0.704→ 0.707), the teachers' model (0.696 → 0.700), the students' model (0.702 ← 0.704), while the parents reported 0.688 → 0.693. Thus, it was reported that a slight decrease on the goodness-of-fit index was only reported for the students' model.

The normed fit index values showed an increase when the Use Behaviour construct was removed from the model. The comparative findings were: the overall model (0.846 → 0.849), the teachers' model (0.832 →0.837), the students' model (0.839 → 0.840), and the parents' model (0.844 →0.847).

Likewise, the incremental fit index values for the three models were investigated. Their values seemed to increase with the removal of the Use Behaviour construct from the final model. However, the findings for the overall model (0.847 → 0.850) and the teachers' model (0.842 → 0.845) increased with the removal of the Use Behaviour construct. The incremental fit index values for the students' model (0.832 ← 0.843), and the parents model (0.838 ← 0.846) decreased with the removal of the Use Behaviour construct.

The Tucker-Lewis fit index showed an increase in the values for the overall model (0.837 →0.839), the teachers' model (0.831 → 0.833), and the parents' model (0.836 →0.838) when the construct of Use Behaviour was removed from the model. However, there was decrease in the Tucker-Lewis fit index value when the Use Construct was removed from the students' model (0.832← 0.833).

The comparative fit index values for the two models showed an increase with the removal of the Use Behaviour construct. That is, the overall model increased from (0.847 →0.850), the teacher model increased from (0.842 → 0.845), while the parent model went from (0.846 → 0.849). However, the comparative fit index values for the student model remained constant at 0.843 for both the model with and without the Use Behaviour construct.

Likewise, the relative fit index values for the overall model (0.835 → 0.838), the teachers' model (0.821 → 0.824), and the parents' model (0.833 → 0.835) increased with the removal of the Use Behaviour construct. However, there was no change to the students' model, which remained constant at 0.828 for both the models under investigation.

It was also appropriate to investigate the standardised root mean square residual (SRMR), the root mean square error of approximation (RMSEA). The RMSEA values showed an increase in the overall model (0.092 →0.096), the teachers' model (0.092 →0.096), the students' model (0.091 → 0.096), and the parent's model (0.096 → 0.101). Likewise, the same comparison was made for the SRMR. The values showed an increase in the overall model (0.379 →0.387), the teachers' model (0.364 →0.375), the students' model (0.374 →0.383), and the parents' model (0.3912 →0.399). However, it is worth noting here that the values for SRMR were not within the acceptable range. Nevertheless, the comparative fit indices for the model with the Use Behaviour construct and the one without the Use Behaviour construct clearly show that the values of the relative fit indices increases upon the removal of the Use Behaviour construct in the TAM 3.

Table 7.1: The comparative fit indices measures (final model without Use Behaviour).

Model	CMIN/DF	*p*	GFI	NFI	RFI	IFI	TLI	CFI	RMSEA	SRMR
Baseline	< 5	>.05	>.80	>.90	>.90	>.90	>.90	>.90	<.08	<.09
Overall model without Use Behaviour	100.46	<.001	0.707	0.849	0.838	0.850	0.839	0.850	0.096	.387
Teachers'	16.28	<.001	0.700	0.837	0.824	0.845	0.833	0.845	0.096	.375
Students'	34.62	<.001	0.702	0.840	0.828	0.832	0.832	0.843	0.096	.383
Parents'	55.46	<.001	0.693	0.847	0.835	0.838	0.838	0.849	0.101	.399

Notes: GFI= Goodness of Fit Index, NFI= Normed Fit Index, RFI= Relative Fit Index, IFI=Incremental Fit Index, TLI=Tucker Lewis Index, CFI=Comparative Fit Index, RMSEA= Root Mean Standard Error Approximation.

7.3. Comparative Investigation of H2, and H3 Using the Technology Acceptance Model 3 without the Use Behaviour Construct

In the full TAM 3, Use Behaviour is the main dependent variable, while Behavioural Intention is the independent variable. However, when the construct of Use Behaviour is removed from the model, Behavioural Intention becomes the dependent variable, while Perceived Ease of Use and Perceived Usefulness become the two main direct independent variables. In this section, for the purposes of comparison with other studies that have used TAM 3 without the construct of Use Behaviour, it was considered necessary to investigate the effect of Perceived Usefulness on Behavioural Intention (H2), the effect of Perceived Ease of Use on Behavioural Intention (H3), and also the effect of Perceived Ease of Use on Perceived Usefulness (H4). This section of the study did not intend to investigate the effect of Subjective Norm on Behavioural Intention (H5) because, for the purposes of investigating the influence of culture on the acceptance and use of the Noor system, the current study investigated the effect of Subjective Norm on Image (H7). However, some studies that used the TAM 3 did not investigate this relationship and, thus, the hypothesis was not fit for comparative purposes in this section.

7.3.1. Teachers' Data

Among the teachers, Perceived Ease of Use had the strongest effect on Perceived Usefulness (H4); this was followed by the effect of Perceived Usefulness on Behavioural Intention (H2), and then by the effect of Perceived Ease of Use on Behavioural Intention (H3). See Table 7.2.

Table 7.2: Teachers' Standardised Regression Weights without Use Behaviour.

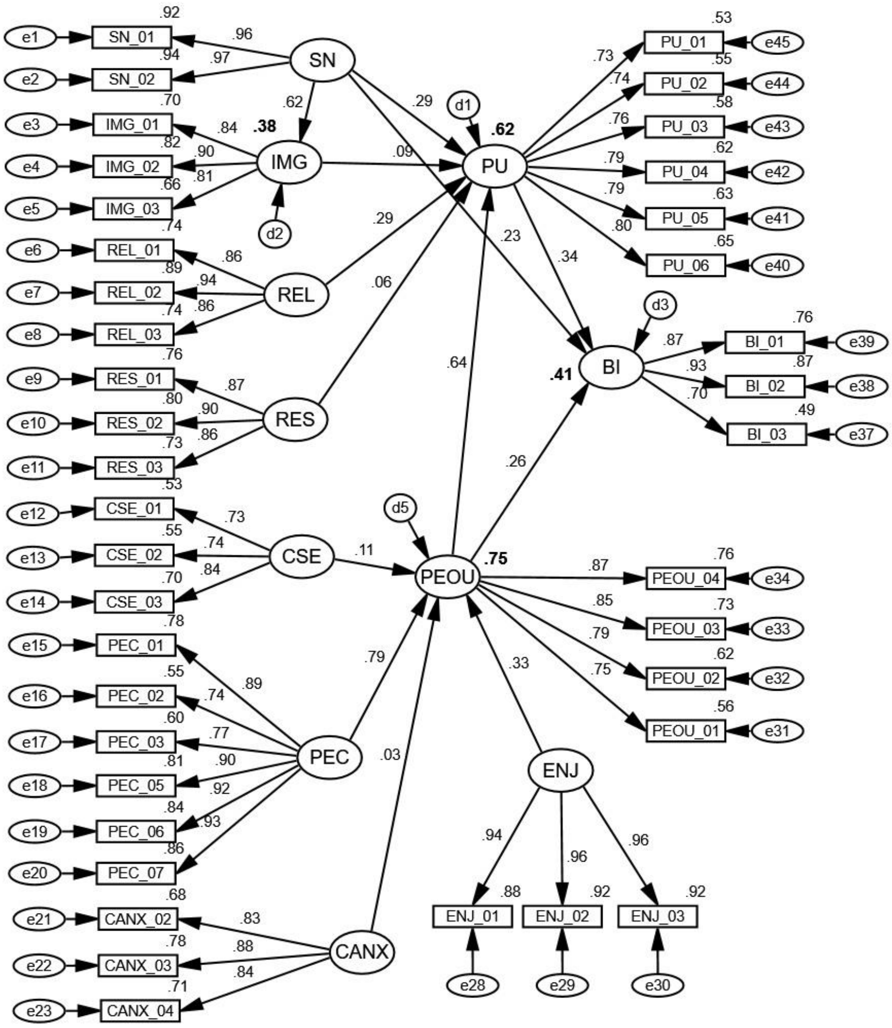
Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H2: BI <---PU	0.391	0.041	9.53	<.001
H3: BI <---PEOU	0.233	0.028	8.21	<.001
H4: PU <---PEOU	0.490	0.019	25.55	<.001

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention.

7.3.2. The Path Diagram on the Teachers' Model Without the Use Behaviour Construct

The factor loadings without the construct of Use Behaviour were as follows: Perceived Usefulness ranged from 0.53 to 0.65, Behavioural Intention from 0.49 to 0.87, Perceived Ease of Use from 0.56 to 0.76, Perceived Enjoyment from 0.89 to 0.92, Computer Anxiety from 0.68 to 0.78, Perceptions of External Control from 0.55 to 0.86, Computer Self-Efficacy from 0.53 to 0.70, Results demonstrability from 0.73 to 0.80, Job Relevance from 0.74 to 0.89, Image from 0.66 to 0.82, and Subjective Norm from 0.92 to 0.94. Most of these ranges show that, upon removing the construct of Use Behaviour from the teacher path diagram and the student path diagram, most of the items had retained their minimum threshold of 0.50 or above, as suggested by Hair et al. (2014). However, the range for Behavioural Intention was slightly below the minimum threshold of 0.50. See Figure 7-1.

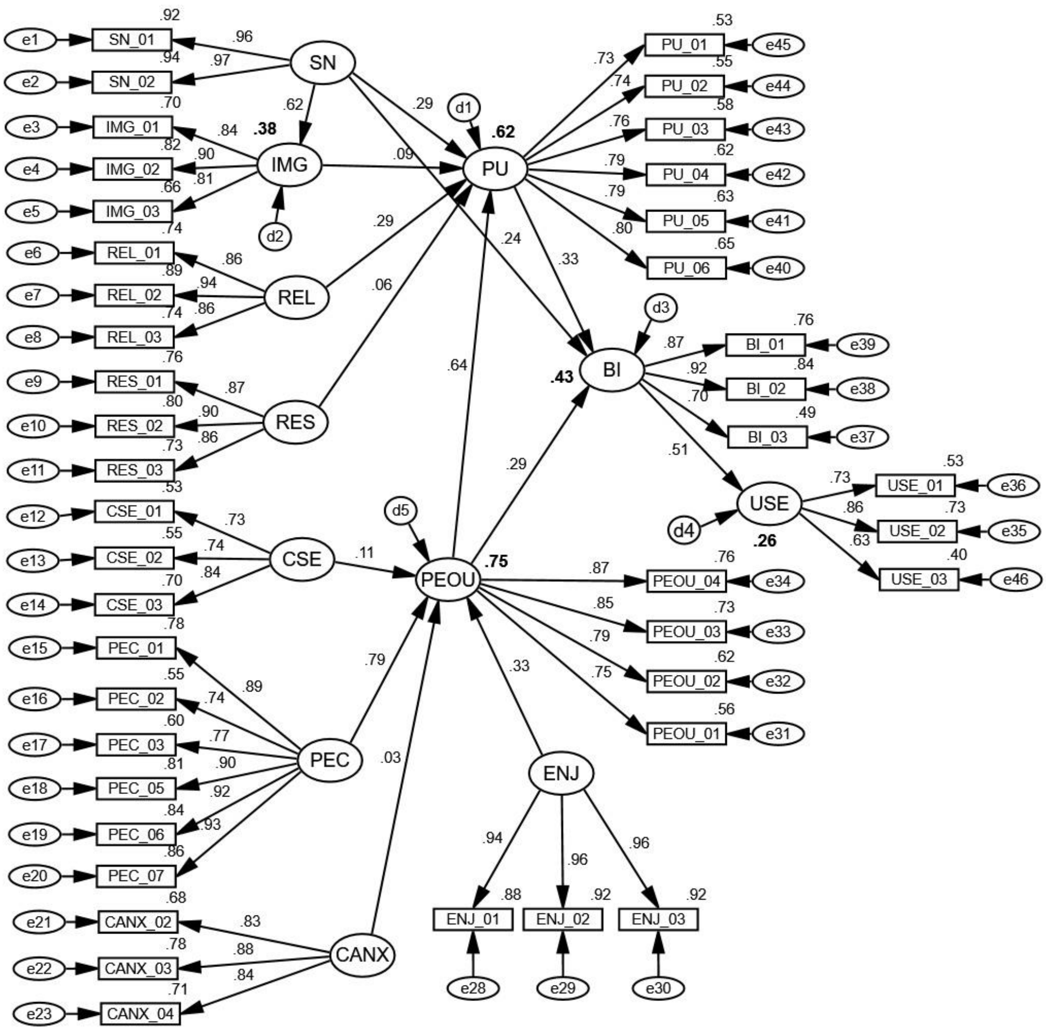
Figure 7-1: Path Diagram on Teachers without Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

The factor loadings with the construct of Use Behaviour were as follows: Perceived Usefulness ranged from 0.53 to 0.65, Behavioural Intention from 0.49 to 0.84, Perceived Ease of Use from 0.56 to 0.76, Perceived Enjoyment from 0.88 to 0.92, Computer Anxiety from 0.68 to 0.78, Perceptions of External Control from 0.55 to 0.86, Computer Self-Efficacy from 0.53 to 0.70, Results demonstrability from 0.73 to 0.80, Job Relevance from 0.74 to 0.89, Image from 0.66 to 0.82, and Subjective Norm from 0.92 to 0.94. Most of these ranges show that, following the retention of the Use Behaviour construct in the teacher path diagram and the student path diagram, most of the items had retained their minimum threshold of above 0.50, as suggested by Hair et al. (2014). However, the range for Behavioural Intention was slightly below the minimum threshold of 0.50. See Figure 7-2.

Figure 7-2: Path Diagram on Teachers with Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

The only construct that was affected by the removal of the Use Behaviour construct on the TAM 3 was Behavioural Intention, for which the range of the factor loadings increased.

7.3.3. Parents' Data

Among the parents, Perceived Ease of Use had the strongest effect on Perceived Usefulness (H4). This was followed by the effect of Perceived Ease of Use on Behavioural Intention (H3), and then by the effect of Perceived Usefulness on Behavioural Intention (H2). See Table 7.3.

Table 7.3: Parents' Standardised Regression Weights without Use Behaviour.

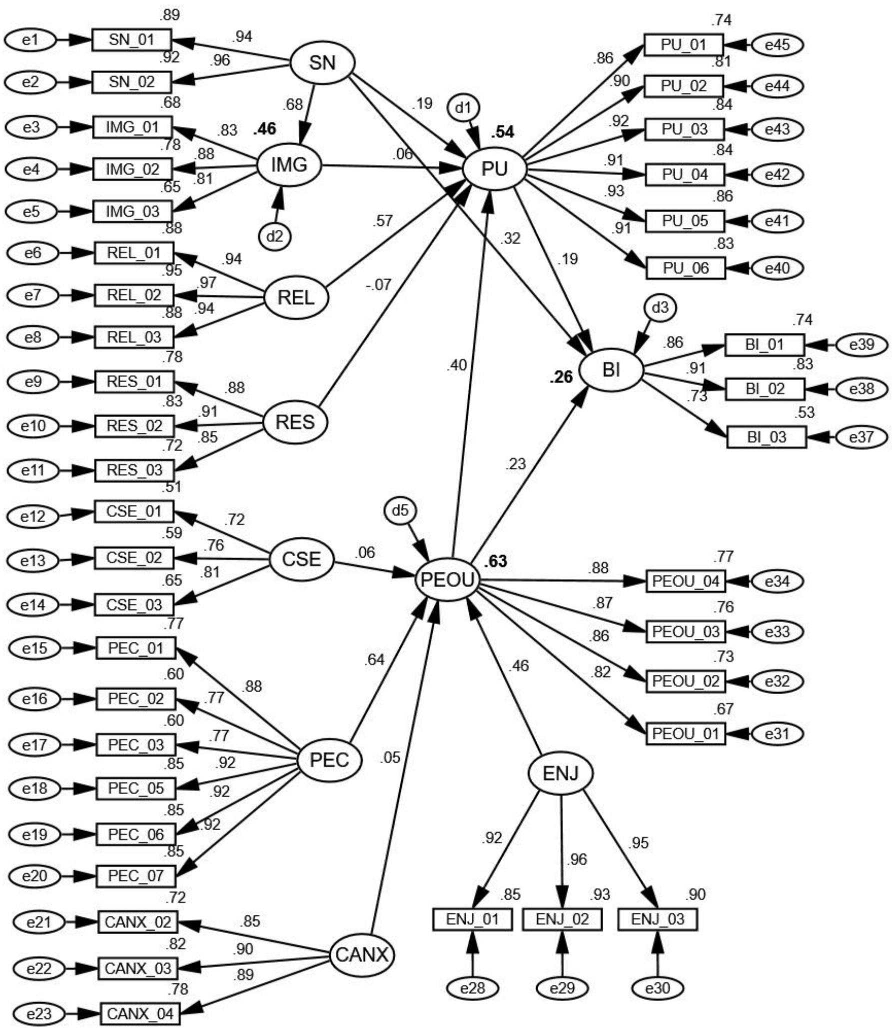
Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H2: BI <---PU	0.172	0.014	12.51	<.001
H3: BI <---PEOU	0.204	0.013	15.70	<.001
H4: PU <---PEOU	0.376	0.01	35.98	<.001

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention.

7.3.4. Path Diagram of the Parents' Model Without the Use Behaviour Construct

The factor loadings without the construct of Use Behaviour were as follows: Perceived Usefulness ranged from 0.74 to 0.86, Behavioural Intention from 0.53 to 0.83, Perceived Ease of Use from 0.67 to 0.77, Perceived Enjoyment from 0.85 to 0.93, Computer Anxiety from 0.72 to 0.82, Perceptions of External Control from 0.60 to 0.85, Computer Self-Efficacy from 0.51 to 0.65, Results demonstrability from 0.72 to 0.83, Job Relevance from 0.88 to 0.95, Image from 0.65 to 0.78, and Subjective Norm from 0.89 to 0.92. These ranges on the parent path diagram shows that, even upon the removal of the Use Behaviour construct, the items maintained their required minimum threshold of above 0.50, as suggested by Hair et al. (2014). See Figure 7-3.

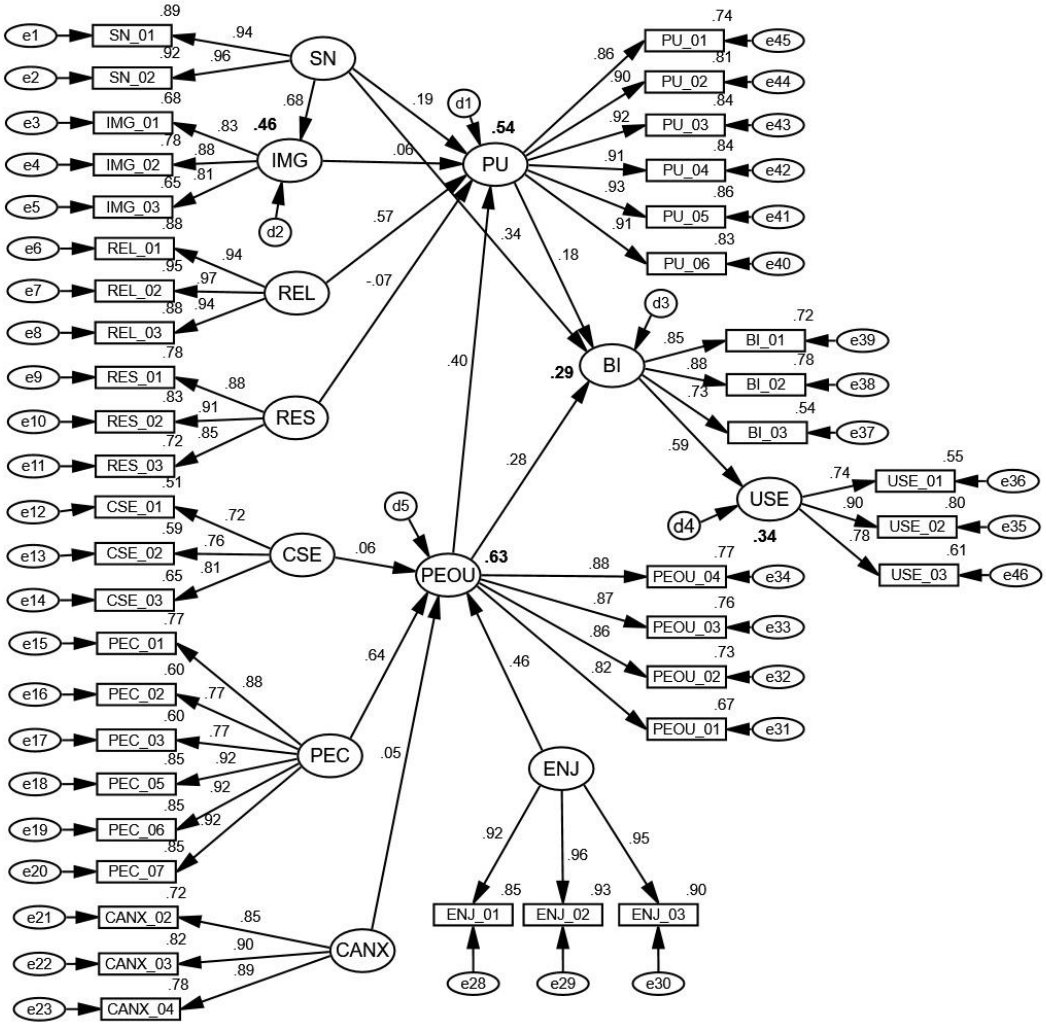
Figure 7-3:Path Diagram on Parents without Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

The factor loadings with the construct of Use Behaviour were as follows: Perceived Usefulness ranged from 0.74 to 0.86, Behavioural Intention from 0.54 to 0.78, Perceived Ease of Use from 0.67 to 0.77, Perceived Enjoyment from 0.85 to 0.93, Computer Anxiety from 0.72 to 0.82, Perceptions of External Control from 0.60 to 0.85, Computer Self-Efficacy from 0.51 to 0.65, Results demonstrability from 0.72 to 0.83, Job Relevance from 0.88 to 0.95, Image from 0.65 to 0.78, and Subjective Norm from 0.89 to 0.92. These ranges on the student path diagram shows that, even when the Use Behaviour construct is retained, the items maintain their required minimum threshold of above 0.50, as suggested by Hair et al. (2014). See Figure 7-4.

Figure 7-4: Path Diagram on Parents with Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

Similarly, just like the student model and the teacher model, the range for the factor loadings on Behavioural Intention increased upon the removal of the Use Behaviour construct from the TAM 3.

Overall, it is worth concluding that, when the Use Behaviour construct is removed from the TAM 3, irrespective of whether the system setting is mandatory or voluntary, then the factor loadings on Behavioural Intention will increase.

7.3.5. Students' Data

However, among the students, the strongest effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention (H3). This was followed by the effect of Perceived Ease of Use on Perceived Usefulness (H4). The weakest effect was observed on the relationship between Perceived Ease of Use and Behavioural Intention (H3). See Table 7.4.

Table 7.4: Students' Standardised Regression Weights without Use Behaviour.

Hypotheses	*Estimate*	*S.E.*	*C.R.*	*p*
H2: BI <---PU	0.204	0.019	10.69	<.001
H3: BI <---PEOU	0.303	0.016	21.41	<.001
H4: PU <---PEOU	0.289	0.012	23.59	<.001

Notes: PEOU= Perceived Ease of Use, PU=Perceived Usefulness, BI=Behavioural Intention.

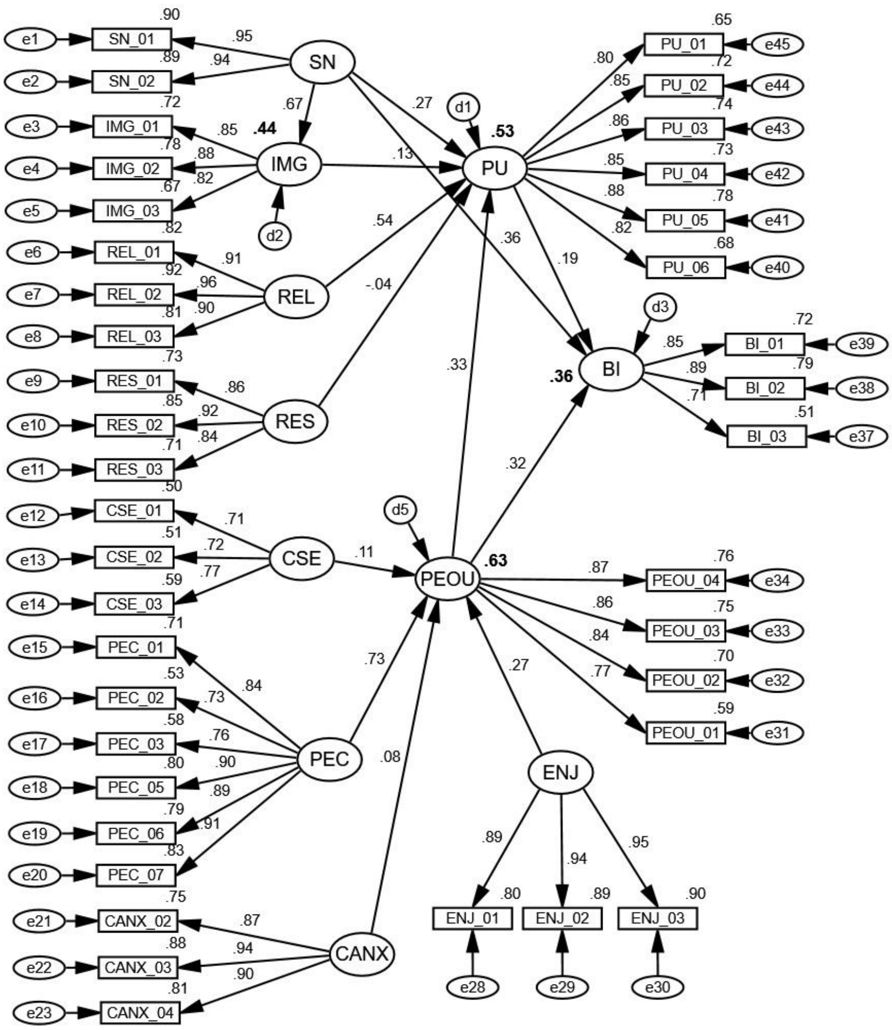
7.3.6. Path Diagram on the Students' Model Without the Use Behaviour Construct

The path diagram on the students' model when Use Behaviour is removed shows the correlation values, the factor loadings, and the and the explained variances.

The factor loadings without the Use Behaviour construct were as follows: Perceived Usefulness ranged from 0.65 to 0.78, Behavioural Intention from 0.51 to 0.79, Perceived Ease of Use from 0.59 to 0.76, Perceived Enjoyment from 0.80 to 0.90, Computer Anxiety from 0.75 to 0.88, Perceptions of External

Control from 0.53 to 0.83, Computer Self-Efficacy from 0.50 to 0.59, Results demonstrability from 0.71 to 0.85, Job Relevance from 0.81 to 0.92, Image from 0.67 to 0.82, and Subjective Norm ranged from 0.72 to 0.90. The ranges that are portrayed on the student path diagram show that, even when the Use Behaviour construct was removed, the items had achieved the minimum threshold of 0.50, as suggested by Hair et al. (2014). See Figure 7-5.

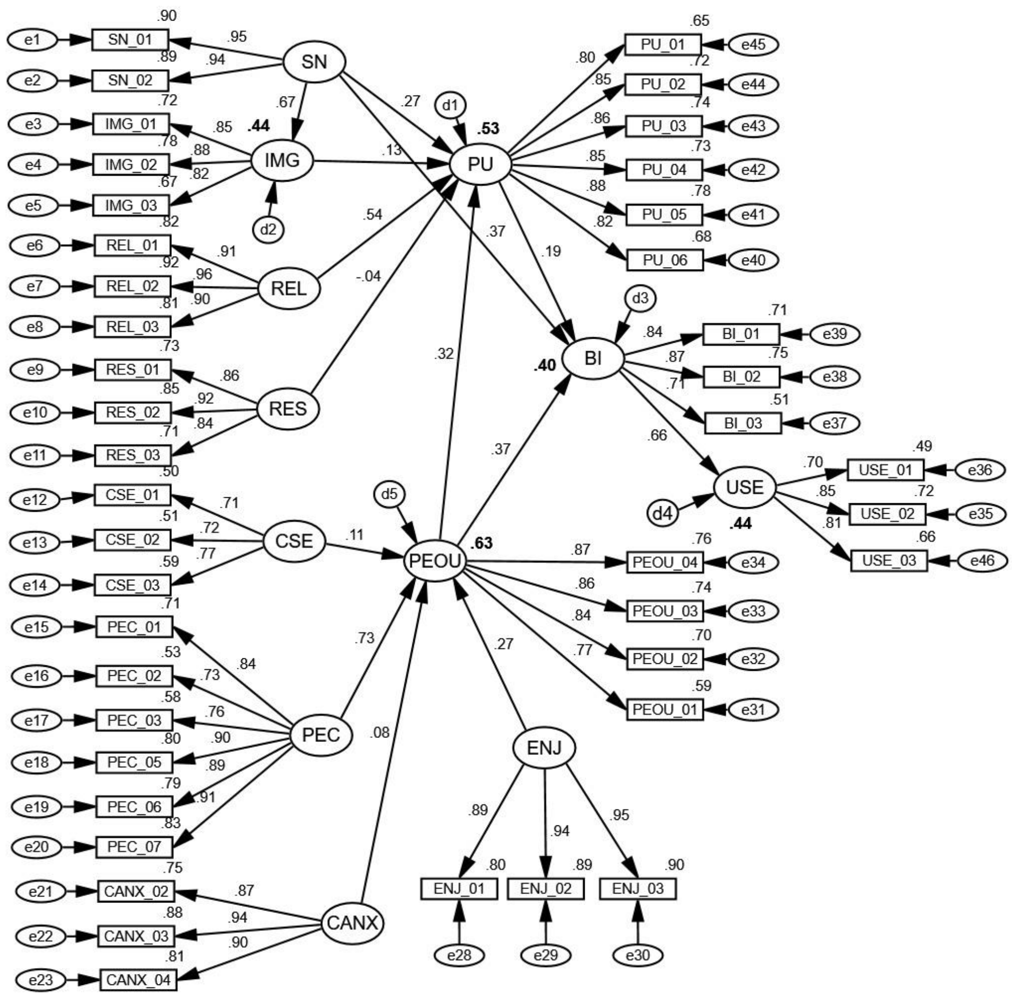
Figure 7-5: Path Diagram on Students without Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

When Use Behaviour was retained, the factor loadings were as follows: Perceived Usefulness ranged from 0.65 to 0.78, Behavioural Intention from 0.51 to 0.75, Perceived Ease of Use from 0.59 to 0.76, Perceived Enjoyment from 0.80 to 0.90, Computer Anxiety from 0.75 to 0.88, Perceptions of External Control from 0.53 to 0.83, Computer Self-Efficacy from 0.50 to 0.59, Results demonstrability from 0.71 to 0.85, Job Relevance from 0.81 to 0.92, Image from 0.67 to 0.72, and Subjective Norm from 0.89 to 0.90. Most of these ranges shows that, when Use Behaviour was retained in the teacher and student path diagrams, most of the items attained the minimum threshold of 0.50, as suggested by Hair et al. (2014). However, the range for Behavioural Intention was slightly below the minimum threshold of 0.50. See Figure 7-6.

Figure 7-6: Path Diagram on Students with Use Behaviour



Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability.

From the findings above, it was concluded that the removal of the Use Behaviour construct from the TAM 3 only led to an increase in the range for the Behavioural Intention factor loadings. Likewise, it was concluded that, when the Use Behaviour construct was removed from the Noor system study, the effect of Perceived Useful on Behavioural Intention was strongest in the mandatory setting (teachers). The effect of Perceived Ease of Use on Behavioural Intention was reported to have the strongest effect in a voluntary setting (students). Lastly, the effect of Perceived Ease of Use on Perceived Usefulness was reported to have the strongest effect in a mandatory setting (teachers).

7.4. Comparative R-squared Values for Groups Upon the Removal of the Construct Use Behaviour

This section compares the explained variance for the TAM 3 when Use Behaviour is either retained or removed. Likewise, these findings were compared among the three groups in this study. See Table 7.5. Upon closer observation, no changes were observed in the R-squared values for Perceived Ease of Use and Perceived Usefulness among the two models under comparison. However, notable changes were observed with regard to Behavioural Intention. The relative percentages were computed to show the magnitude of the difference between the two models after the removal of the Use Behaviour construct. When the Use Behaviour construct was removed from the Technology Acceptance Technology Model 3 that was being used to investigate the applicability of the Noor system in the KSA, a decline was observed in the R-squared values for Behavioural Intention. The overall model had a decline of 8.6%, the teachers' model 4.7%, the students' model 10.3%, while the parents' model had a 10% decline. These findings clearly demonstrate that, when the information system has been in use, it is very important to retain the Use Behaviour construct in the TAM 3, as its removal will have a significant effect on the variance explained by Behavioural Intention. However, this study was not designed to investigate the effect of removing the Use Behaviour construct when the system was new.

Table 7.5: Comparative R-Squared Values on Groups.

Main constructs	Full model with USE	T	P	S	Full model without USE	T	P	S
PEOU	0.65	0.75	0.63	0.63	0.65	0.75	0.63	0.63
PU	0.54	0.62	0.54	0.53	0.54	0.62	0.54	0.53
BI	0.35	0.43	0.29	0.40	0.32	0.41	0.26	0.36

Notes: PEOU=Perceived Ease of USE, PU=Perceived Usefulness, BI=Behavioural Intention, T=Teachers', P=Parents', S=Students'.

7.5. Conclusion

This section was developed to investigate the importance of retaining Use Behaviour as the main dependent variable in the TAM 3, especially taking into consideration the self-reporting of system usage in information systems. The literature categorises system usage as actual usage, assessed usage, or self-reported usage. Researchers have the prerogative to design and measure Use Behaviour according to the context of their study. Actual system usage is best measured using longitudinal studies, while assessed usage and self-reported usage are mainly measured using cross-sectional studies. As has already been noted in the literature, most technology acceptance studies do not measure Use Behaviour, but instead substitute it with Behavioural Intention as the main dependent variable. The Use Behaviour construct was removed from the final model in this section. This allowed for a detailed investigation into the impact of its removal on the TAM 3. The findings for the mandatory and voluntary settings were compared.

The findings presented in this section have shown that, once Use Behaviour is removed from the TAM 3, the factor loadings on Behavioural Intention increase. However, the factor loadings on the other determinants and constructs will remain the same. Likewise, the relative fit indices on the model without Use Behaviour tend to increase, especially the CMIN/DF, the Standardised Root Mean Residual, and the Root Mean Standardised Error Approximation. Thus, as these measures increase, they surpass their required minimum threshold. Thus, it becomes more likely that the model will be rejected. Similarly, it has been shown in this section that the removal of the Use Behaviour construct from the TAM 3 has an impact on the variance explained by Behavioural Intention. Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness are the main determinants in the Technology Acceptance Model. However, this study has clearly shown that it is only Behavioural Intention that is affected by the removal of the Use Behaviour construct. The variance explained by Perceived Ease of Use and perceived Usefulness remains the same. The variance explained by Behavioural Intention decreases upon the removal of Use Behaviour construct from the TAM 3. However, it is worth noting that the effect of its removal is much higher in voluntary settings than in mandatory settings.

In conclusion, the Noor study advocates for the importance of having Use Behaviour as the main dependent variable in the TAM 3, especially when the system usage is under investigation and is being measured by users' self-reporting of their usage. This section also concluded that the removal of Use Behaviour has an impact on the relative fit indices, the factor loadings, and the variance explained by Behavioural Intention. The impact on Behavioural Intention can be attributed to the direct relationship that it is assumed to have with Use Behaviour.

8 CHAPTER EIGHT: DISCUSSION AND INTERPRETATION OF THE TECHNOLOGY ACCEPTANCE MODEL 3: ANALYSIS IN THE KINGDOM OF SAUDI ARABIA

8.1. Introduction

This chapter presents the findings of the 19 hypotheses that were tested in the current study using the TAM 3. This section provides further elaboration of the possible explanations for the unsupported and supported hypotheses. The summary is arranged according to the order of the research questions, followed simultaneously by the results of their corresponding hypotheses. The current study had five main objectives that were investigated in terms of their respective hypotheses.

8.2. Testing the Appropriateness of the Noor System in the Kingdom of Saudi Arabia Using the Technology Acceptance Model 3

This objective was investigated by comparing the test results of the Noor system model with the studies by Venkatesh and Bala (2008); Al-Gahtani (2016). These two studies have some similarities with the Noor system study in that they share the adoption of the constructs of the 'full' TAM 3, and the investigation of Perceived Ease of Use, Perceived Usefulness and Behavioural Intention. A comparison of the findings from the two studies and the Noor system is shown in Table 5.6.

These findings reveal that the Noor system model offered a much better prediction of the variance in Perceived Ease of Use compared to Venkatesh and Bala (2008); Al-Gahtani (2016) because it explained 65% of the variance in the final model. Similarly, the variances for the models of teachers, students, and parents were reported to explain a higher variance compared to the two studies. The Noor system is considered a better predictor of Perceived Ease of Use because the sample size for the Noor system was N= 10,711, compared to N=286 for Al-Gahtani (2016) and N=156 for Venkatesh and Bala (2008) for the three time periods during which the data were collected. Wang et al. (1996); Schermelleh-Engel et al. (2003) state that sample size plays a noticeable role in SEM estimation, as large sample sizes have better parameter estimates compared with small sample sizes. Similarly, large sample sizes tend to reduce sampling error in the study and thus generate findings that have better parameter estimates compared to small sample sizes. Thus, the Noor System model was a better predictor of Perceived Ease of Use.

Similarly, the Noor system model (β = .54) had slightly higher variance in Perceived Usefulness compared to the result of β = .52 obtained by Venkatesh and Bala (2008). The model used by Al-Gahtani (2016) was the least effective in terms of explaining the variance in Perceived Usefulness. Regarding Behavioural Intention, there was little difference between the obtained variances. Nevertheless, the Parents' model (β = .29) had by far the least variance in Behavioural Intention compared to the other model. Lastly, Table 5.6 shows that only the Noor system model tested the variance explained by Image and Use Behaviour. In summary, the investigation of the Noor system in the KSA using the TAM 3 was very appropriate in the current study, and helps address the areas omitted in the studies of Venkatesh and Bala (2008); Al-Gahtani (2016) in terms of explaining the variance in Image and Use Behaviour in the TAM 3.

In conclusion, the first objective in the current study was fully investigated by comparing its findings with Venkatesh and Bala (2008); Al-Gahtani (2016). The current study confirms that it was appropriate to investigate the Noor system in the KSA using the TAM 3 because its explained variance values for Perceived Ease of Use were stronger in the Noor system model. The explained variance for Perceived Usefulness and Behavioural Intention were very similar to the findings reported by Venkatesh and Bala (2008); Al-Gahtani (2016).

8.3. Comparing the Applicability of the Technology Acceptance Model 3 in the Noor System Among Organisational Users (Mandatory) and Public/Non-Organisational Users (Voluntary) in the Kingdom of Saudi Arabia

The above second objective was tested in the current study by investigating the applicability of the TAM 3 in both mandatory and voluntary settings. The teachers were considered the mandatory users and parents and students the voluntary users of the Noor system in the KSA. Thus, the summary of the comparative analysis of the mandatory and the voluntary settings is shown in Table 11.1 in Appendix A, and their influences are explained with respect to the *Beta* estimates.

8.3.1. H1: Use Behaviour <---Behavioural Intention

The influence of Behavioural Intention on Use Behaviour was most significant for the students (β = .661), followed by the parents (β = .586). The teachers had the least effect with (β = .511; see Table 11.1 in Appendix A). Thus, it was concluded that the influence of Behavioural Intention on Use Behaviour was strongest under the voluntary settings because the teachers representing the mandatory settings had the least effect. Similarly, the overall Noor system model showed that Behavioural Intention had a slightly stronger influence (β = .608) on Use Behaviour compared with Venkatesh and Bala (2008), who reported (β = .59). Al-Gahtani (2016) did not investigate this relationship (see Table 11.1 in Appendix A). The findings of the current study are similar to those of Al-Gahtani (2008); Venkatesh and Bala (2008), who reported that Behavioural Intention was a significant predictor of Use Behaviour. In the context of the KSA, the Noor system is used to monitor the academic progress of children in schools. The Saudis showed a strong preference towards the use of the Noor system in the voluntary context, and this study thus concluded that Saudis were more likely to use the Noor system in a voluntary rather than mandatory setting. Thus, the current study concluded that Behavioural Intention has the strongest positive influence on Use Behaviour in a voluntary setting in the context of the KSA. In the comparative analysis between Saudis and non-Saudis, diverse findings were obtained. The effect size of Behavioural Intention on Use Behaviour was higher among non-Saudi teachers and parents compared to Saudi teachers and parents. This led to the conclusion that Behavioural Intention had the strongest effect on Use Behaviour among the non-Saudi teachers and parents compared to the Saudis (see Table 11.2 in Appendix B). Nevertheless, the Saudi students had the highest effect size compared to the non-Saudi students. Thus, it was concluded that the Saudi students have the strongest effect of Subjective Norm on Behavioural Intention. Hence, H1 was accepted and rephrased to state that Behavioural Intention has the strongest positive, significant and direct effect on Use Behaviour in the Noor system in a voluntary setting.

8.3.2. H2: Behavioural Intention <---Perceived Usefulness

The influence of Perceived Usefulness on Behavioural Intention was most significant for the teachers (β = .333). This finding shows that the more the teachers perceive the Noor system to be useful in their job-related tasks, the more likely their Behavioural Intention to use it will increase, and vice versa. Thus, the current study concurs with the finding of Al-Gahtani (2008) that Behavioural Intention has a strong indirect influence on Perceived Usefulness regarding the use of an IT system, especially in a mandatory setting. The lowest effects were for the students and parents (β = .185) and (β = .178) respectively (see Table 11.1 in Appendix A). Thus, it was concluded that the influence of Perceived Usefulness on Behavioural Intention was the strongest under the mandatory setting for the teachers. This finding is in agreement with studies by Aladwani and Aladwani (2002); Selim (2003); Akour et al. (2006); Al-Khateeb (2007); Al-Gahtani (2008); Venkatesh and Bala (2008), who reported that the Behavioural Intention to use a particular IT system was positively influenced by how the end-users perceive its usefulness. Therefore, the more the end-users perceive a system to be useful in their task, the stronger the Behavioural Intention to use it. The overall Noor system model showed that Perceived Usefulness had the least influence (β = .212) on Behavioural Intention, compared with Venkatesh and Bala (2008), who reported (β = .56) and Al-Gahtani (2016), who reported (β = .37) (see Table 11.1 in Appendix A). However, this does not mean that Perceived

Usefulness had no strong influence on Behavioural Intention, because each study investigated a different system. Thus, it was concluded that in the Noor system context, Perceived Usefulness has a positive and a significant influence on Behavioural Intention to use the Noor system under the mandatory setting in the context of the KSA. The effect size of Perceived Usefulness on Behavioural Intention was higher among the non-Saudi teachers (55%) compared to the Saudi teachers (51%), and among the non-Saudi parents (40%) compared with the Saudi parents (28%). These findings lead to the conclusion that for teachers and parents the effect size of Perceived Usefulness on Behavioural Intention was higher for non-Saudis compared to Saudis. However, regarding students, Perceived Usefulness had the highest effect size on Saudi students (36%) compared with non-Saudi students (35%). Similarly, the findings for the effect size confirm that the results obtained for the TAM 3 of the Noor system, where Perceived Usefulness was reported to have the strongest effect on Behavioural Intention under the mandatory setting (teachers) (see Table 11.3 in Appendix B). H2 was accepted and rephrased to state that Perceived Usefulness has the strongest positive and significant effect on Behavioural Intention of the Noor system under the mandatory setting.

8.3.3. H3: Behavioural Intention <---Perceived Ease of Use

Perceived Ease of Use on Behavioural Intention had the strongest significant influence on the students (β = .368). The teachers and the parents had the least effect, with results of (β = .287) and (β = .275) respectively (see Table 11.1 in Appendix A). Thus, it was concluded that the influence of Perceived Ease of Use on Behavioural Intention was the strongest under the voluntary setting for the students. Overall, the Noor system model showed that Perceived Ease of Use had the strongest influence (β = .306) on Behavioural Intention compared with Al-Gahtani (2016) (β = .25). The findings for the Noor system are supported by the results of studies by Aladwani and Aladwani (2002); Akour et al. (2006); Venkatesh and Bala (2008), who reported that Perceived Ease of Use had a positive significant effect on Behavioural Intention. Thus, in the Saudi context, it was concluded that the greater the extent to which students perceive the Noor system to be easier to use, the higher their Behavioural Intention to adopt and use the system. It was also surprising to note that the teachers had the least effect compared to the students. Whilst the use of the Noor system is commonly associated with teachers rather than students, this is not in fact the case. The Behavioural Intention to use the Noor system for the students was strongly influenced by Perceived Ease of Use (under the voluntary setting), while for the teachers it was strongly influenced by the Perceived Usefulness of the Noor system (under the mandatory setting) (see Table 11.1 in Appendix A). Nevertheless, it was concluded that Perceived Ease of Use has a positive and a significant influence on Behavioural Intention to use the Noor system under the voluntary setting in the context of the KSA. The effect size was highest among the teachers, especially the non-Saudis, who had a 50% effect size. Similarly, among the parents, the effect size of Perceived Ease of Use on Behavioural Intention was highest among the non-Saudi parents, at 36%. These two findings led to the conclusion that the effect size of Perceived Ease of Use on Behavioural Intention is higher among non-Saudis, especially under the mandatory setting. Thus, the non-Saudis consider that the higher the Perceived Ease of Use of the Noor system, the higher the Behavioural Intention to use it. Similarly, if they do not perceive the Noor system to be easier to use, their Behavioural Intention to use it will decline (see Table 11.4 in Appendix B). However, among the students, the effect size of Perceived Ease of Use was slightly higher for the Saudi students (31%) compared to the non-Saudi students (29%). Thus, it was concluded that the more the Saudi students perceive the Noor system to be easy to use, the more likely their Behavioural Intention to use the system will increase. Thus, H3 was accepted and rephrased to state that Perceived Ease of Use has the strongest positive and significant effect on Behavioural Intention of the Noor system under the voluntary setting.

8.3.3.1. H3a: Behavioural Intention <---Perceived Ease of Use X Experience

The finding for the two-way interaction between (Perceived Ease of Use X Experience) in the relationship with Behavioural Intention showed that the Noor system had a positive significant influence (β = .054) on Behavioural Intention. This was slightly higher than the figure obtained by Al-Gahtani (2016) (β = .01;

see Table 11.1 in Appendix A). It was thus concluded that although the influence of the moderation interaction between (Perceived Ease of Use X Experience) on Behavioural Intention was not very strong, it had a positive influence among Noor users. This contrasts with Venkatesh and Bala (2008), who reported a negative influence (β = -.24) in Western culture. A comparison of teachers, students, and parents showed that experience was reported to have a significant positive moderation effect on the students (β = .089) and parents (β = .053) while the teachers had a significant negative moderation effect (β = -.099) (see Table 11.1 in Appendix A). The findings of the univariate analysis showed the effect size of Experience on Perceived Ease of Use and Behavioural Intention (see Table 11.5 in Appendix B). These findings show that the effect of Experience on Perceived Ease of Use towards Behavioural Intention becomes weaker with an increase in Experience, especially for non-Saudi teachers, students and parents, which is in agreement with the finding reported by Venkatesh and Bala (2008). Similarly, regarding Saudis, the effect size of Experience amongst teachers and students weakened as Experience increased. Nevertheless, the effect size became moderately strong among Saudi parents. Thus, in the Saudi culture, Experience has a strong moderating effect on the relationship between Perceived Ease of Use and Behavioural Intention, especially amongst parents in the KSA under the voluntary setting (see Table 11.5 and Figure 11-1 in Appendix B). Thus, for non-Saudis and Saudi teachers and students, H3a was accepted and rephrased to state that the relationship between Perceived Ease of Use and Behavioural Intention becomes weaker with an increase in Experience when using the Noor system. However, this was rejected for Saudi parents and rephrased to state that the relationship between Perceived Ease of Use and Behavioural Intention becomes stronger with an increase in Experience when using the Noor system.

Regarding nationality and Behavioural Intention, only the interaction between Perceived Ease of Use and Experience using the Noor system had a slightly more significant effect size (13%) among Saudi teachers (see Table 11.6 in Appendix B). Thus, it was concluded that the more experience the Saudi teachers gain in the use of the Noor system, the more likely they are to perceive the system to be easier to use, which is likely to significantly influence their future use of the Noor system.

8.3.4. H4: Perceived Usefulness <---Perceived Ease of Use

In terms of the influence of Perceived Ease of Use on Perceived Usefulness, the strongest significant influence was on the teachers (β = .643), followed by the parents and students (β = .397 and β = .325 respectively; see Table 11.1 in Appendix A). Thus, in the mandatory setting the influence of Perceived Ease of Use on Perceived Usefulness was strongest for the teachers. Overall, the Noor system model showed that Perceived Ease of Use had the strongest influence (β = .418) on Perceived Usefulness (the figure obtained by Al-Gahtani (2016) was β = .21; see Table 11.1 in Appendix A). This finding was in agreement with studies by Rose and Straub (1998); Selim (2003); Al-Gahtani (2008); Anderson et al. (2008); Venkatesh and Bala (2008); Harby et al. (2010); Anderson et al. (2011); Al-Adwan et al. (2013); Alharbi and Drew (2014), who reported that Perceived Ease of Use had a positive significant effect on Perceived Usefulness. Nevertheless, it was concluded that the Perceived Ease of Use of the Noor system has a positive and significant influence on the Perceived Usefulness of the adoption of technology in the KSA under the mandatory setting. Thus, it was concluded that the easier the end-users perceive the Noor system to be, the more useful they will find it in their tasks, especially under the mandatory setting. This finding was supported by the effect size finding for the teachers. The effect size was significantly higher for the non-Saudi teachers (70%) compared to the Saudi teachers (61%). Thus, it was concluded that, under the mandatory setting, the easier the teachers perceive the Noor system to be, the greater the likelihood they will find it useful in their work duties. Similarly, the effect size for the non-Saudi parents was slightly higher than for the Saudis. However, for the students, the Saudis students had a higher effect size compared to the non-Saudis students (see Table 11.7 in Appendix B). Thus, H4 was accepted and rephrased to state that Perceived Ease of Use has the strongest positive and significant effect on the Perceived Usefulness of the Noor system under the mandatory setting.

8.3.4.1. H4a: Perceived Usefulness <---Perceived Ease of Use X Experience

The two-way interaction of the overall the Noor system model between (Perceived Ease of Use X Experience) and the relationship with Perceived Usefulness showed that the Noor system had a negative insignificant influence (β = -.017) on Perceived Usefulness. This was slightly lower than the figure obtained by Al-Gahtani (2016) (β = .08; see Table 11.1 in Appendix A). The findings regarding the effect of Experience on Perceived Ease of Use and Perceived Usefulness contrast with those of Venkatesh and Bala (2008), who reported that the effect became stronger with an increase in Experience. In the current study, the effect size was investigated on the basis of the nationality of the respondents. It was reported that the effect size of Experience for Perceived Ease of Use amongst the non-Saudis towards Perceived Usefulness fluctuated constantly and did not exhibit a linear trend. The fluctuation was weak for the parents (voluntary setting) compared to the teachers (mandatory setting) and the students (voluntary setting), who showed a slight upward trend (see Figure 11-8 in Appendix B). Thus, the finding for the parents contradicts that of Venkatesh and Bala (2008), although the Noor study did not specify the nationality of the non-Saudis (see Figure 11-9 in Appendix B). Hence, it was difficult to determine whether the non-Saudi teachers and students investigated were influenced by the Western context because they came from other Middle East countries. In the Noor study, as experience of using Noor increased, the effect size of Experience on Perceived Ease of Use and Perceived Usefulness became weak (see Table 11.8 and Figure 11-2 in Appendix B), which shows a decline in the trend for both the voluntary and the mandatory settings. Thus, it was concluded that the effect size of Experience on using Noor system in the context of the KSA decreases as experience increases, in contrast with the Western context. In terms of the effect size of nationality, Saudi culture exerts strong influence on the perceived Usefulness of the Noor system compared to other non-Saudi nationals based in the KSA. A research gap that needs to be addressed in future studies was also identified with regard to the non-Saudis. The findings for this group were similar to those reported by Venkatesh and Bala (2008) in the Western context. It is not clear why the results for non-Saudi would be different to Saudis in terms of the effect size of Experience on Perceived Ease of Use towards the Perceived Usefulness of the Noor system.

The interaction effect of Perceived Ease of Use and Experience using the Noor system on Perceived Usefulness showed a significant effect size of 20% among Saudi teachers. The interaction effect on the students was negligible and not significant. Nevertheless, although the interaction effect for the parents was significant, the effect size was negligible. Thus, it was concluded that the interaction effect of Perceived Ease of Use and Experience using the Noor system on Perceived Usefulness was only significant among Saudi teachers (see Table 11.9 in Appendix B). Figure 11-2 in Appendix B shows that the interaction effect of Perceived Ease of Use on Perceived Usefulness becomes weaker as use of the Noor system increases. Thus, H4a was rejected and rephrased to state that over time experience has a weaker significant moderation effect on Perceived Ease of Use and Perceived Usefulness of the Noor system under the mandatory setting.

8.3.5. H5: Behavioural Intention <---Subjective Norm

The influence of the Subjective Norm on Behavioural Intention was strongest for the students (β = .373) and parents (β = .340). The teachers showed the least influence (β = .243; see Table 11.1 in Appendix A). Thus, H5 was retained and rephrased to state that Subjective Norm has a strong significant effect on Behavioural Intention under the voluntary setting. This shows that Subjective Norm has the strongest influence on students in the KSA, while it has the least influence on teachers. The findings of the current study are similar to those of Baker et al. (2010); Al-Gahtani (2016), who reported Subjective Norm to have a positive significant effect on Behavioural Intention. Thus, the influence of Subjective Norm on Behavioural Intention was the strongest under the voluntary setting for the students. The figure of β = .35 obtained by Al-Gahtani (2016) showed that Subjective Norm had a slightly stronger influence on Behavioural Intention compared to the overall Noor system model, in which Subjective Norm had an influence of (β = .338) on Behavioural Intention (see Table 11.1 in Appendix A). Venkatesh and Bala (2008) did not report a significant relationship, thus confirming that Subjective Norm has no influence in Western culture. Thus, it was concluded that Subjective Norm (the Saudi culture) has a positive and significant influence on Behavioural Intention to use the Noor system, especially under the voluntary setting. The KSA is well-known for its strong cultural background. This prompted the review of the effect size of the Subjective Norm on Behavioural Intention by comparing the nationalities that participated in the Noor study, as shown on Table 11.10 in Appendix B. The effect sizes of Subjective Norm on Behavioural Intention for the teachers, students and parents were higher for Saudis nationals compared with non-Saudi from other Middle Eastern countries. This led to the conclusion that Subjective Norm has a higher effect size on Behavioural Intention to use the Noor system for Saudi teachers, students, and parents, confirming that the cultural effect of Subjective Norm is very strong among Saudis compared to other nationalities.

8.3.5.1. H5a: Behavioural Intention<---Subjective Norm X Experience

The two-way interaction in the overall the Noor system model between (Subjective Norm X Experience) in the relationship with Behavioural Intention showed that the Noor system had a significant negative influence (β = -.071) on Behavioural Intention, although it was slightly lower compared with Al-Gahtani (2016) (β = -.1; see Table 11.1 in Appendix A). These two studies from the KSA confirmed that Experience had a significant negative moderation effect on the relationship between Subjective Norm and Behavioural Intention. In contrast, Venkatesh and Bala (2008) reported that Experience had no significant moderation effect (β = .04) on Behavioural Intention in a Western context. When the relationship tables were plotted, the influence of Experience in the relationship between Subjective Norm and Behavioural Intention was reported to be negative in terms of the Noor system for both non-Saudi and Saudi participants. These findings confirmed that as Experience with using the Noor system increases, its effect becomes weaker. The effects were much weaker for Saudi parents and teachers compared to the students. For the non-Saudis, the effect of Experience was much weaker among the parents and students compared to the teachers (see Table 11.11, Table 11.12, and Figure 11-3, Figure 11-4, and Figure 11-5 in Appendix B). Thus, H5a was retained and rephrased to state that the interaction of Experience and Subjective Norm has a weaker significant effect on the Behavioural Intention to use the Noor system.

The effect size of Experience and Subjective Norm on Behavioural Intention became much weaker as Experience increased, although the effects were much weaker for Saudi teachers (see Figure 11-3 in Appendix B, and for non-Saudi parents see Figure 11-5 in Appendix B).

8.3.5.2. H5b: Behavioural Intention<---Subjective Norm X Voluntariness

For the overall the Noor system model, the effect of Voluntariness and Subjective Norm on Behavioural Intention showed that the Noor system had a negative significant influence ($\beta =\ .173$). Al-Gahtani (2016) did not test the general role of Voluntariness in the interaction between Subjective Norm and Behavioural Intention, but only generalised his findings with respect to the voluntary setting (see Table 11.1 in Appendix A). Similarly, his study did not report the actual *p*-value or the *Beta* estimate for this general H5b relationship between Subjective Norm and Behavioural Intention. In contrast, the pooled results of Venkatesh and Bala (2008) showed that Voluntariness had no significant moderation effect on Behavioural Intention in a Western context, although the findings from the three time periods showed significant moderation effects. Similarly, the authors stated that Voluntariness significantly moderates the effect of Subjective Norm on Behavioural Intention in mandatory settings. However, in terms of the time periods during which they documented their findings, they did not specify the length of the time period in which they investigated this relationship in the mandatory setting. This therefore constitutes a research gap that merits further investigation. The interaction effect between Voluntariness and Subjective Norm on Behavioural Intention was most significant effect for Saudi teachers (25%). Although the findings for the Saudi students and parents were significant, the effect size was negligible (see Table 11.13 in Appendix B). Thus, it was concluded that the interaction effect between Voluntariness and Subjective Norm was only strong among Saudi teachers under the mandatory setting, compared to non-Saudi teachers. This finding is in agreement with Venkatesh and Bala (2008), who reported that the effect of Voluntariness and Subjective Norm on Behavioural Intention was strongest under the mandatory setting. Thus, H5b was accepted and rephrased to state that the interaction effect of Voluntariness and Subjective Norm has a significant moderation effect on Behavioural Intention to use the Noor system.

8.3.5.2.1. H5c: Behavioural Intention<---Subjective Norm X Voluntariness (Mandatory Setting)

The role of Voluntariness in the relationship between Subjective Norm and Behavioural Intention was investigated under the mandatory setting. This was achieved by assessing this relationship using the teachers' sample. The teachers' model showed that Voluntariness play a negative significant moderation role under the mandatory setting (β = - .099). The study by Al-Gahtani (2016) did not investigate the role of Voluntariness in the relationship between Subjective Norm and Behavioural Intention in the mandatory setting (see Table 11.1 in Appendix A). Although Venkatesh and Bala (2008) claimed to investigate this relationship under the mandatory setting, they did not state the exact *p*-value and its *Beta* estimate. Thus, the Noor system study was able to identify this relationship as a research gap requiring further investigation. It was therefore concluded that Voluntariness had a negative significant moderation effect on the relationship between Subjective Norm and Behavioural Intention under the mandatory settings in the Noor system study in the KSA. Nevertheless, the interaction effect was significantly higher among the Saudi teachers compared with the non-Saudi teachers, as shown in Table 11.14 in Appendix B. Thus, H5c was accepted and confirmed that Voluntariness and Subjective Norm have a negative significant moderation effect on Behavioural Intention to use the Noor system under the mandatory setting.

8.3.5.2.2. H5e: Behavioural Intention<---Subjective Norm X Voluntariness (Voluntary Setting)

The role of Voluntariness in the relationship between Subjective Norm and Behavioural Intention was investigated under the voluntary setting. In this case, the parents and the students represented the voluntary settings in terms of the use of the Noor system. The findings revealed that Voluntariness has a negative significant moderation effect on the relationship between Subjective Norm and Behavioural Intention for both the students and parents under the voluntary setting (see Table 11.1 in Appendix A). The effect was much stronger for the students (β = - .188) compared with the parents (β = - .134). Venkatesh and Bala (2008); Al-Gahtani (2016) tested this relationship and stated that the moderation role under the voluntary setting was much stronger than under the mandatory setting. However, the two studies did not provide the *p*-value and the *Beta* estimate reported a positive significant moderation effect. However, with the Noor system model, the findings from both its models (the parents and the students) showed that Voluntariness has negative *Beta* values, thus confirming that Voluntariness has a weaker effect on the relationship between Subjective Norm and Behavioural Intention in the voluntary setting. Thus, the current study on the Noor system addresses a gap on Al-Gahtani (2016), specifically bearing in mind the disparities in the sample size between the two studies. Table 11.15 in Appendix B shows that the interaction effect size of Voluntariness and Subjective Norm on Behavioural Intention was significant for the Saudi students and parents, although their effect sizes were negligible. Thus, H5e was rejected and rephrased to state that the interaction effect of Voluntariness and Subjective Norm has a weaker significant moderation effect on Behavioural Intention to use the Noor system under the voluntary setting.

8.3.5.3. H5d: Behavioural Intention<---Subjective Norm X Voluntariness X Experience (Mandatory Setting)

The hypothesis is a three-way moderation interaction that was tested under the mandatory setting using Voluntariness and Experience as the two moderators in the relationship between Subjective Norm and Behavioural Intention. Therefore, the teachers represented the mandatory settings. The finding from the Noor system study revealed that Voluntariness and Experience had no significant moderation effect on the relationship between Subjective Norm and Behavioural Intention under the mandatory setting. Venkatesh and Bala (2008) reported a weaker significant moderation effect on their pooled results, but this was in a Western context (see Table 11.1 in Appendix A). Similarly, Al-Gahtani (2016) did not investigate this relationship in his study carried out in the KSA. Thus, the Noor system study was able to identify and address this research gap in the Saudi context. In terms of the comparison between Saudi and non-Saudi teachers, the interaction effect was significantly higher for non-Saudi teachers who had two to three years' experience of using the Noor system. Similarly, the effect was much higher for Saudi teachers who had six to 12 months' experience of using the Noor system (see Table 11.17 in Appendix B). The trend of the effect size regarding Experience of using the Noor system revealed that as Experience increases, the effect size for non-Saudi teachers becomes strong, while that for the non-Saudi teachers becomes weaker (see Figure 11-6 and Figure 11-7 in Appendix B). Thus, H5d was rejected and it was restated that the interaction effect of Voluntariness and Experience on Subjective Norm has no significant moderation effect on Behavioural Intention to use the Noor system under the mandatory setting.

8.3.5.4. H5f: Behavioural Intention<---Subjective Norm X Voluntariness X Experience (Voluntary Setting)

The three-way moderation interaction was similarly investigated using Voluntariness and Experience as moderators under the voluntary settings. In this case, the parents and students represented the voluntary settings in the use of the Noor system. The findings revealed that Voluntariness and Experience only have a positive significant moderation effect on the relationship between Subjective Norm and Behavioural Intention for parents (β = .042) (see Table 11.1 in Appendix A). Venkatesh and Bala (2008) stated that in the voluntary setting, the findings were significant. Al-Gahtani (2016) did not investigate this relationship. (see Table 11.1 in Appendix A). Thus, a gap was identified and addressed in the current study on the Noor system. Under the voluntary setting, the non-Saudi parents had a significant effect size, although the effect was negligible (see Table 11.18 in Appendix B). As Experience of using the Noor system increases among the Saudi students, the interaction effect size of Voluntariness and Subjective Norm on Behavioural Intention also increases (see Figure 11-8 in Appendix B). Nevertheless, for the non-Saudi students, both the Saudi and non-Saudi parents as Experience increases, the effect size becomes weaker. These findings are in agreement with Venkatesh and Bala (2008), who that reported that under the voluntary context, as Experience increased, the effect of Subjective Norm on Behavioural Intention became weaker. Thus, H5f was rejected and was rephrased to state that the interaction effect of Voluntariness and Experience on Subjective Norm has a positive significant moderation effect on Behavioural Intention to use the Noor system under the voluntary setting.

8.3.6. H6: Perceived Usefulness <---Subjective Norm

In terms of the influence of Subjective Norm on Perceived Usefulness, the strongest and most significant influence was on the teachers (β = .288) followed by the students (β = .274) (see Table 11.1 in Appendix A). It was concluded that the influence of Subjective Norm on Perceived Usefulness was the strongest under the mandatory setting for the teachers. This finding was supported by the effect size test, which showed that under the mandatory setting, the effect size was higher for teachers, especially Saudi teachers (54%, compared to 45% for the non-Saudi teachers). Similarly, also under the voluntary setting, the Saudi students and parents had higher effect sizes compared with their non-Saudi counterparts (Table 11.19 in Appendix B). Nevertheless, the lowest influence was on the parents under the voluntary setting with (β = .187). Overall, the Noor study revealed that Subjective Norm had the strongest influence on Perceived Usefulness compared to the study by Al-Gahtani (2016) (see Table 11.1 Appendix A). The study by Venkatesh and Bala (2008) did not report a significant effect on this relationship in the pooled findings. Thus, it was concluded that in the Saudi culture, Subjective Norm has a positive significant effect on Perceived Usefulness, a finding supported by studies by Anderson et al. (2008); Baker et al. (2010); Anderson et al. (2011) and Al-Gahtani (2003), which contrasts with the results from Western culture obtained by Venkatesh and Bala (2008) in their TAM 3 study. However, the T1 results, as reported by Venkatesh and Bala (2008), had a positive significant effect. Thus, H6 was retained and rephrased to state that Subjective Norm has a positive significant effect on Perceived Usefulness.

8.3.6.1. H6a: Perceived Usefulness <---Subjective Norm X Experience

The two-way moderation interaction between (Subjective Norm X Experience) on Perceived Usefulness was investigated. In the overall model, the moderation interaction of Experience had a positive significant influence on the relationship between Subjective Norm and Perceived Usefulness (β = .079). Studies by Venkatesh and Bala (2008); Al-Gahtani (2016) reported a significant negative moderation effect (see Table 11.1 in Appendix A). Similarly, the comparative results for the Noor system shown in Table 11.1 in Appendix A show that the moderation effect was much stronger for the students (β = .097) compared to the parents (β = .086). The finding for the teachers was not significant. Thus, with respect to the Noor system, it was concluded that the two-way moderation interaction between (Subjective Norm X Experience) and Perceived Usefulness is significant under voluntary setting, but not under the mandatory setting. Therefore, H6a was rejected and it was restated that Experience has a positive moderation effect of Subjective Norm and Perceived Usefulness of the Noor system under the voluntary setting.

Al-Gahtani (2016) reported a significant negative moderation effect using only one sample (see Table 11.1 in Appendix A). The Noor system used three samples: teachers, parents and students, all of whom had a positive *Beta* estimate. The Noor system study thus identified and addressed this research gap.

The effect size regarding nationality revealed highly significant effects, as shown in Table 11.20 in Appendix B. The effect sizes for Saudis were higher compared to non-Saudis. The non-Saudi teachers were the only category in which the effect size of Subjective Norm on Perceived Usefulness increased alongside experience of using the Noor system, as shown in Figure 11-9 in Appendix B. Nevertheless, Saudi teachers, both Saudi and non-Saudi parents and students showed a negative correlation as experience of using the Noor system increased. These findings are in agreement with those of Venkatesh and Bala (2008); Baker et al. (2010), who found that the effect of Experience on Subjective Norm towards Perceived Usefulness attenuates over time, meaning that its effect becomes weaker. The effect size had the sharpest decline amongst

Saudi teachers, compared to other categories, as shown in Figure 11-10 in Appendix B.

8.3.7. H7: Image <---Subjective Norm

The strongest and most significant influence of Subjective Norm on Image was on parents (β = .682), followed by students (β = .666) and teachers (β = .619) (see Table 11.1 in Appendix A). It was concluded that the influence of Subjective Norm on Image was the strongest under the voluntary setting. This finding was confirmed by the effect size, which showed that Saudi parents had the highest effect size. Similarly, a comparison of the different nationalities showed that the effect size for the three group categories was stronger among the Saudis than non-Saudis, as shown in Table 11.21 in Appendix B. The effect size was significantly higher among the Saudi parents compared to other groups. The findings for the Noor system were in agreement with the studies by Venkatesh and Bala (2008); Baker et al. (2010); Al-Gahtani (2016), both of whom reported that Subjective Norm has a positive significant effect on Image. Table 11.1 in Appendix A showed that the Noor system had the strongest significant effect (β = .669), compared with studies by Venkatesh and Bala (2008) (β = .24) and Al-Gahtani (2016) (β = .44). Thus, it was concluded that in the Noor system, Subjective Norm has the strongest effect on Image in Saudi culture, compared to Western culture and non-Saudi from other Middle Eastern countries, as shown in Table 11.21 in Appendix B. H7 was therefore retained and it was restated that Subjective Norm has a positive significant effect on Image when using the Noor system, and its effect is much stronger under the voluntary setting.

8.3.8. H8: Perceived Usefulness <---Image

Students were most strongly influenced by the effect of Image on Perceived Usefulness (β = .125), followed by teachers (β = .089) and parents (β = .058) (see Table 11.1 in Appendix A). These findings are in line with those of Anderson et al. (2008); Venkatesh and Bala (2008); Baker et al. (2010); Anderson et al. (2011), all of whom reported that Image has a significant positive effect on Perceived Usefulness. Thus, in the voluntary setting, the influence of Image on Perceived Usefulness was the strongest for students and had the least influence on parents. These findings were supported by the findings of the effect size. A comparison of the effect of Image on Perceived Usefulness showed that students had the highest effect size compared to the other categories of respondents; that is, Saudi students had the highest effect size compared to non-Saudi students. The current study thus concluded that Image plays a greater role in the perception of the usefulness of the Noor system by Saudis compared with non-Saudi (see Table 11.22 in Appendix B). The Noor system model (β = .1) had very similar findings to the studies of Al-Gahtani (2016) (β = .13). However, Venkatesh and Bala (2008) (β = .24) reported that Image had the strongest influence on Perceived Usefulness in Western culture compared with Saudi culture (see Table 11.1 in Appendix A). Thus, the null hypothesis H8 was accepted and the Noor study confirmed that Image has a positive significant effect on Perceived Usefulness.

8.3.9. H9: Perceived Usefulness <---Job Relevance

In terms of the effect of Job Relevance on Perceived Usefulness, the strongest significant influence was on parents (β = .568), followed by students with (β = .538). The influence on teachers (β = .292) was lowest (see Table 11.1 in Appendix A). These findings are in agreement with those of Venkatesh and Bala (2008); Baker et al. (2010); Alharbi and Drew (2014); Al-Gahtani (2016), all of whom reported that Job Relevance had a positive significant effect on Perceived Usefulness. It was found that parents had the strongest effect size, as shown in Table 11.23 in Appendix B. Similarly, an investigation of the different nationalities found that Saudi parents had the highest effect size compared to non-Saudi parents. The same was reported for students and the teachers. It was thus concluded that the influence of Job Relevance on Perceived Usefulness was the strongest under the voluntary setting. These findings were unexpected, as it was anticipated that under the mandatory settings teachers would firmly link their daily work duties with the Perceived Usefulness of the Noor system. The overall Noor system model reported the strongest positive significant effect (β = .512) compared to Al-Gahtani (2016) (β = .38), while the result of Venkatesh and Bala (2008) (β = .03) was not significant (see Table 11.1 Appendix A). These findings show that the influence of Job Relevance on Perceived Usefulness is much stronger in the Saudi context compared to in a Western context or for non-Saudi from other Middle Eastern countries. Thus, H9 was retained, and it was concluded that Job Relevance has a positive significant effect on Perceived Usefulness.

8.3.9.1. H9a: Perceived Usefulness <---Job Relevance X Output Quality

Output Quality was used to test the two-way moderation interaction in the relationship between Job Relevance and Perceived Usefulness. Output Quality had no significant moderation effect on the relationship between Job Relevance and Perceived Usefulness. This finding contrasts with the studies by Al-Gahtani (2016) (β = .15), and Venkatesh and Bala (2008) (β = .35), which reported that Output Quality has significant moderation effect in the relationship between Job Relevance and Perceived Usefulness (see Table 11.1 in Appendix A). Similarly, the findings for teachers, students and parents showed that Output Quality had no significant moderation effect in the relationship between Job Relevance and Perceived Usefulness. Thus, it was concluded that Output Quality has no significant moderation effect in both the mandatory and the voluntary settings. Therefore, a gap was identified in the study by Al-Gahtani (2016) in the KSA, which prompted further investigation in the current study. The comparative findings regarding the effect size, as shown in Table 11.24 in Appendix B, confirm that the effect size was negligible for the Saudis, and much lower compared to their non-Saudi counterparts. Thus, H9a was rejected and it was concluded that Output Quality does not strongly moderate the effect of Job Relevance on Perceived Usefulness when using the Noor system.

8.3.10. H10: Perceived Usefulness <---Results Demonstrability

In terms of the effect of Results Demonstrability on Perceived Usefulness, the strongest positive significant influence was on the teachers (β = .061). This finding was in agreement with those of Anderson et al. (2008); Venkatesh and Bala (2008); Baker et al. (2010); Anderson et al. (2011), who reported that Results Demonstrability had a positive significant effect on Perceived Usefulness. However, a significant negative influence was observed for both students and parents at (β = -.038 and β = -.07 respectively; see Table 11.1 in Appendix A). These findings show that the influence of Results Demonstrability on Perceived Usefulness was the strongest under the mandatory setting. Overall, the Noor system model had a negative significant effect (β = -.050), although the study done by Al-Gahtani (2016) (β = .02) found no significant effect. The study by Venkatesh and Bala (2008) (β = .26) reported a significant effect (see Table 11.1 in Appendix A). Thus, it was concluded that in Western culture, Results Demonstrability has a positive significant effect on Perceived Usefulness, while in the Saudi culture the Results Demonstrability has a negative significant effect on Perceived Usefulness. Nevertheless, the effect size was much higher for Saudis than non-Saudis, as shown in Table 11.25 in Appendix B. This means that the Saudis cared about the influence of Results Demonstrability on Perceived Usefulness in the Noor system. This prompted the acceptance of H10, which led to the conclusion that Results Demonstrability has a positive significant effect on Perceived Usefulness when using the Noor system, but only under the mandatory setting; under the voluntary setting, it has a negative effect.

8.3.11. H11: Perceived Ease of Use <--- Computer Self-Efficacy

In terms of the effect of Computer Self-Efficacy on Perceived Ease of Use, the strongest significant influence was on the students (β = .115), followed closely by teachers (β = .111). The influence was the lowest on parents (β = .064) (see Table 11.1 in Appendix A). These findings are in line with the studies by Anderson et al. (2008); Venkatesh and Bala (2008); Anderson et al. (2011); Al-Gahtani (2016), who reported Computer Self-Efficacy had a positive significant effect on Perceived Ease of Use. Hence, the influence of Computer Self-Efficacy on Perceived Ease of Use was strongest under the voluntary setting. This supported by the finding on the effect size, which showed that students, especially Saudi students, had a much higher effect size compared to the other categories (see Table 11.26 in Appendix B). Similarly, the overall Noor system model reported a positive significant effect, although the effect was much lower compared to studies by Al-Gahtani (2016) (β = .18) and Venkatesh and Bala (2008) (β = .31), which reported a significant effect (see Table 11.1 in Appendix A). This prompted the conclusion that Computer Self-Efficacy had the strongest effect on Perceived Ease of Use in Western culture compared to Saudi culture. Nevertheless, the effect of Computer Self-Efficacy on Perceived Ease of Use was much higher among the Saudi participants compared to the non-Saudi. This meant that the more the Saudis believe in their Computer Self-Efficacy, the greater the extent to which they perceive the Noor system to be easier to use. Thus, H11 was retained, leading to the conclusion that Computer Self-Efficacy has a positive significant effect on the Perceived Ease of Use of the Noor system; this effect is much stronger among Saudis than non-Saudi.

8.3.12. H12: Perceived Ease of Use <---Perceptions of External Control

In terms of the effect of Perceptions of External Control on Perceived Ease of Use, the strongest significant influence was on teachers (β = .792), followed closely by students (β = .733). The influence on parents was the lowest (β = .643) (see Table 11.1 in Appendix A). The findings of the Noor system support those of studies by Venkatesh and Bala (2008); Al-Gahtani (2016), who reported that Perceptions of External Control were a significant predictor of Perceived Ease of Use. Thus, the influence of Perceptions of External Control on Perceived Ease of Use was strongest under the mandatory setting. The overall Noor system model revealed that Perceptions of External Control had the strongest influence (β = .721) on Perceived Ease of Use, compared to Al-Gahtani (2016) (β = .45) and Venkatesh and Bala (2008) (β = .33), who reported a significant effect (see Table 11.1 in Appendix A). These comparative findings lead to the conclusion that Perceptions of External Control had the strongest influence on Perceived

Ease of Use in the Saudi culture compared to the Western culture. The findings shown in Table 11.27 in Appendix B confirm that the effect of Perceptions of External Control on Perceived Ease of Use was stronger among teachers, particularly those from Saudi Arabia. This fact supports the notion that the availability of resources and support structure that facilitates the use of the Noor system in the KSA has a direct and significant influence on the way in which teachers, students and parents perceive the Noor system to be easier for them to use. Therefore, H12 was accepted, leading to the conclusion that Perceptions of External Control has a positive significant effect on Perceived Ease of Use of the Noor system, with the effect being much stronger among Saudis compared with non-Saudis in all the three groups.

8.3.13. H13: Perceived Ease of Use <---Computer Anxiety

In terms of the effect of Computer Anxiety on Perceived Ease of Use, the most significant influence was on the students' model (β = .084). The influence was followed by the parents (β = .053), and then by the teachers (β = .032) (see Table 11.1 in Appendix A). These findings contrast with studies by Anderson et al. (2008); Anderson et al. (2011), who reported that Computer Anxiety had a significant negative influence on Perceived Ease of Use. The influence of Computer Anxiety on Perceived Ease of Use was therefore weakest under the mandatory setting. The overall Noor system model revealed that the relationship between Computer Anxiety and the Perceived Ease of Use had a significant positive effect (β = .061). The findings reported by Al-Gahtani (2016) (β = -.11) and Venkatesh and Bala (2008) (β = -.18) were in contrast to the Noor system study (see Table 11.1 in Appendix A). Table 11.28 in Appendix B confirmed that the effect sizes were only significant among Saudi parents and students, although their effect sizes were negligible. These confirm the weak effect of Computer Anxiety on Perceived Ease of Use. The findings for the non-Saudis were insignificant in all three groups under investigation. The weak effect of Computer Anxiety on Perceived Ease of Use led to the conclusion that Computer Anxiety is no longer a strong factor that influences the extent to which both Saudis and non-Saudis perceive the Noor system to be easier to use. This led to the acceptance of H13 and the conclusion that Computer Anxiety has a significant negative effect on Perceived Ease of Use when using the Noor system.

8.3.13.1. H13a: Perceived Ease of Use <---Computer Anxiety X Experience

The two-way moderation interaction was investigated using Experience as a moderator in the relationship between Computer Anxiety and Perceived Ease of Use. Nevertheless, no significant moderation interaction was reported in the Noor system model (β =.023) or in Al-Gahtani (2016) (β = -.03). Venkatesh and Bala (2008) reported a significant negative moderation effect (β = -.22) (see Table 11.1 in Appendix A). Thus, it was concluded that Experience has no significant moderation interaction in the relationship between Computer Anxiety and Perceived Ease of Use in Saudi culture, although it has a negative significant moderation effect in western culture. This fact was confirmed by the findings for the teachers, students and parents, which did not reveal any significant moderation effects (see Table 11.1 in Appendix A). Similarly, the findings in Table 11.29 in Appendix B show that the effect sizes for Experience using the Noor system were negligible in all categories, apart from teachers who had less than six months' experience of using the Noor system. Nevertheless, a closer examination of the different nationalities showed that as Experience of using the Noor system increased, the effect sizes for Saudi teachers, parents, and students, as well as non-Saudi teachers and students, became weaker. Although these findings do not interpret the moderation interaction obtained in the Noor study, the effect sizes are in agreement with the study by Venkatesh and Bala (2008), who reported that as experience increased, the effect became weaker; that is, the effect of Experience attenuates with time. Therefore, H13a was rejected and rephrased to state that, although Experience has a negative effect on the relationship between Computer Anxiety and Perceived Ease of Use, it does not have any negative moderation effect after an increase in the time spent using the Noor system.

8.3.14. H15: Perceived Ease of Use <---Perceived Enjoyment

In terms of the effect of Perceived Enjoyment on Perceived Ease of Use, the strongest significant influence was on parents (β = .463), followed by teachers at (β = .33). The influence was the lowest for students (β = .272) (see Table 11.1 in Appendix A). Thus, the influence of Perceived Enjoyment on Perceived Ease of Use was the strongest under the voluntary setting. The overall Noor system model revealed that Perceived Enjoyment had the strongest effect on Perceived Ease of Use. Al-Gahtani (2016) had a significant positive effect, while Venkatesh and Bala (2008) investigated the relationship but did not report any significant findings (see Table 11.1 in Appendix A). This relationship identifies a gap that has been addressed by the Noor system model. In summary, it was concluded that Perceived Enjoyment has a significant positive effect in the Saudi context, whereas it has no significant effect in the Western context. Similarly, a comparison of nationalities confirmed that teachers, especially Saudi teachers, had a significantly higher effect size compared to non-Saudi. The same scenario was evident in the comparison of teachers and students (see Table 11.30 in Appendix B). Thus, H15 was accepted and it was concluded that Perceived Enjoyment has a positive significant effect on Perceived Ease of Use when using the Noor system.

8.3.14.1. H15a: Perceived Ease of Use <---Perceived Enjoyment X Experience

Experience was used in the two-way interaction to investigate the relationship between Perceived Enjoyment and Perceived Ease of Use. The overall Noor model revealed that Experience had a significant negative moderation effect (β = -.031) on the relationship between Perceived Enjoyment and Perceived Ease of Use. Al-Gahtani (2016) (β = .08) reported a significant positive moderation effect in the Saudi context, while Venkatesh and Bala (2008) (β = .18) reported a significant positive moderation effect in the Western context (see Table 11.1 in Appendix A). A closer comparison of teachers, students and parents shows that they all had a negative *Beta* estimate (see Table 11.1 in Appendix A). Nevertheless, the parents reported that Experience had a significant negative moderation effect in the relationship between Perceived Enjoyment and

Perceived Ease of Use. This meant that Experience has a weak significant moderation effect in a voluntary setting in the Saudi context. Similarly, in the overall Noor model, the models for teachers, students and parents all had negative *Beta* estimates, while Al-Gahtani (2016) reported a positive *Beta* coefficient. Al-Gahtani (2016) revealed a major gap that was investigated using the four models in the Noor system study. In conclusion, it was reported that Experience has a negative significant moderation effect on the relationship between Perceived Enjoyment and Perceived Ease of Use in the Saudi context, whereas in the Western context it had a positive significant effect. The trend in the effect sizes for non-Saudi teachers, parents and students, and Saudi students and parents, showed that as Experience of using Noor system increases, the effect of Perceived Enjoyment on Perceived Ease of Use becomes weaker (see Table 11.31 in Appendix B). These findings are in contrast with those of Al-Gahtani (2016), who reported a positive *Beta* coefficient for Perceived Enjoyment on Perceived Ease of Use based on a sample from the KSA. Nevertheless, a closer observation of the correlation analysis on the effect sizes of the Saudi samples in the Noor system shows that Saudi parents reported the strongest negative decline, followed by the Saudi students, although the sample for the teachers showed a slight increase in the effect of using the Noor system in terms of the relationship between Perceived Enjoyment and Perceived Ease of Use. Therefore, H15a was rejected and it was concluded that Experience negatively moderates the effect of Perceived Enjoyment on Perceived Ease of Use as the time spent using the Noor system by both the Saudis and non-Saudis increases.

8.3.15. H14: Perceived Ease of Use <---Computer Playfulness and H16: Perceived Ease of Use <---Objective Usability

These two hypotheses were not tested in the current study because the Computer Playfulness item failed the factor loadings tests, while the items on Objective Usability had factor loadings above 0.60. These were removed from the final model because it was difficult to measure Objective Usability without performing an actual experimental usability test of the Noor system on teachers, students and parents; their entire constructs were thus removed from the model.

Therefore, in summary, after exploring all the hypotheses that were tested in the current study, together with their moderation interactions, the second objective of the current study was fully investigated. It was concluded that the TAM 3 was applicable in the Noor system among the organisational users (mandatory) and public/non-organisational users (voluntary) in the KSA.

8.4. Exploring the Role that the Demographics Moderators can Play in the Acceptance of The Noor System by Testing the Technology Acceptance Model 3

Socio-demographic variables are very important in terms of describing the characteristic behaviour of the sample used in a study. In the current study, all the three samples (teachers, students and parents) were subjected to moderation testing using some selected demographic variables that were not investigated in the TAM 3 used by Venkatesh and Bala (2008); Al-Gahtani (2016). These studies only investigated Experience, Voluntariness and Output Quality as the main moderators. The group (teachers, students and parents), nationality, experience of the Noor system, gender, Internet Proficiency, Internet Access at Work, Internet Access at Home, Internet Experience, Age and Educational Level were all investigated as the additional socio-demographic moderators in the TAM 3.

Nationality was used as a demographic moderator in which Saudi citizens represented N=8,032, while non-Saudis represented N=2,679. The findings for these interactions are shown in Table 6.6. H1: Use Behaviour←Behavioural Intention revealed that nationality had a stronger moderation effect. The effect was much stronger for the non-Saudis (β = .607) compared with the Saudis (β = .518). Thus, Behavioural Intention was more likely to influence Use Behaviour of the Noor system among non-Saudis compared to Saudis. H2: Behavioural Intention←Perceived Usefulness showed the strongest moderation effect. However, the moderation was much stronger for the non-Saudis (β = .258) compared with the Saudis (β = .198). Nationality therefore had a stronger moderation effect in the relationship between Perceived Usefulness and Behavioural Intention amongst non-Saudis than Saudis. It was then concluded that Perceived Usefulness would be less likely to influence Saudis' Behavioural Intention to use the Noor system compared to non-Saudis. H5: Behavioural Intention←Subjective Norm showed the weakest significant moderation effect. The effect was weakest among non-Saudis (β = .201) compared to Saudis (β = .260). This finding confirmed that the Subjective Norm (the Saudi culture) has the weakest moderation influence on Behavioural Intention compared to the Non-Saudis. Similarly, H6: Perceived Usefulness ←Subjective Norm showed the weakest negative moderation effect was on Nationality. This finding confirms that Nationality plays a huge negative significant role in the relationship between Subjective Norm and Perceived Usefulness; its effect is much stronger for Saudis (β = .200) than for non-Saudis (β = .092). H8: Perceived Usefulness←Image reveals that Nationality has a weak significant moderation effect. The effect was much weaker for the Saudis (β = .082) compared to the non-Saudis (β = .049). The non-Saudis attach greater value to their image than the Saudis with regard to Perceived Usefulness in the use of the Noor system. H9: Perceived Usefulness←Job Relevance showed that nationality had the strongest moderation effect, with the effect being much stronger for non-Saudis (β = .452) compared with Saudis (β = .352). This makes the non-Saudis more likely than the Saudis to view Job Relevance as the most significant factor when rating the Perceived Usefulness of the Noor system. H10: Perceived Usefulness←Results Demonstrability revealed that nationality has a strong moderation effect. However, the moderation effect was strong and significant only for Saudi nationals. This shows that Results Demonstrability matters the most in determining the Perceived Usefulness of the Noor system by Saudis, but has no effect among non-Saudis. H11: Perceived Ease of Use←Computer Self-Efficacy had a weaker moderation effect on nationality. The effect was much weaker for the non-Saudis (β = .043) compared to the Saudis (β = .069). H12: Perceived Ease of Use←Perceptions of External Control had the weakest significant moderation effect by nationality. The effect was much weaker for the non-Saudis (β = .568) compared with the Saudi Nationals (β = .636). This shows that the Saudis attach greater value to Perceptions of External Control in terms of determining the Perceived Ease of Use of the Noor system compared with non-Saudis. Similarly, H15: Perceived Ease of Use←Perceived Enjoyment had a weaker significant moderation effect by nationality. The findings revealed that the effect of nationality as a moderator was much weaker for the non-Saudis (β = .247) compared with the Saudis (β = .276). It was thus concluded that the Saudis value Perceived Enjoyment much more while determining the Perceived Ease of Use of the Noor system when compared with non-Saudis.

Experience with the Noor system was similarly used as a demographic moderator. H1: Use Behaviour←Behavioural Intention showed that at the initial stages of the Noor Experience, there was a strong significant moderation effect, whereas those with six to 12 months' experience of using the Noor system (β = .826) had a stronger moderation effect compared to those with less than six months' experience (β = .691). Nevertheless, as experience increases, its moderation effect on the relationship between Behavioural Intention and Use Behaviour becomes significantly weaker. H2: Behavioural Intention←Perceived Usefulness shows that the moderation effect of the Noor Experience becomes significantly weaker as Experience increases from six to 12 months (β = .826) to 1-2 years (β = .738), but the moderation effect becomes slightly stronger as experience increases to two to three years. Thus, at the early stages, the moderation effect of the Noor Experience on the relationship between Perceived Usefulness and Behavioural Intention becomes weaker, although with an increase in experience, the moderation effect becomes slightly stronger. H3: Behavioural Intention←Perceived Ease of Use shows that Noor Experience had a stronger moderation effect on the relationship between Perceived Ease of Use and Behavioural Intention for those with six to 12 months' of experience (β = .276) compared to those with less than six months' experience (β = .155). Similarly, those with over four years of experience (β = .318) had a much stronger moderation effect compared with those who had three to four years of Noor Experience (β = .255). Thus, it was concluded that as experience increases, the moderation effect of the Noor Experience on the relationship of Perceived Ease of Use and Behavioural Intention becomes stronger. For H4: Perceived Usefulness←Perceived Ease of Use, the moderation effect for those with one to two years' of Noor Experience (β = .416) was strong compared with those with six to 12 months' of Noor Experience (β = .365). However, as the Noor Experience increases to two to three years, the moderation effect becomes significantly weaker. Nevertheless, as it increases to over four years, it becomes significantly stronger. Thus, it was concluded that as the Noor Experience increases, its moderation effect on the relationship between Perceived Ease of Use and Perceived Usefulness becomes stronger. H5: Behavioural Intention←Subjective Norm shows that at the early stages of using Noor, the Noor Experience had the weakest moderation effect at 6-12 months (β = .221). As experience increases to one to two years, the moderation effect becomes stronger (β = .271), though it weakens as experience increases to two to three years (β = .242). However, Noor Experience did not moderate the relationship between Subjective Norm and Behavioural Intention for those with at least three years' experience.

8.4.1. Subjective Norm (H5) versus Demographic Variables

8.4.1.1. H5: Behavioural Intention <---Subjective Norm

8.4.1.1.1. Age

The effect of age on the relationship between Subjective Norm and Behavioural Intention was investigated. Only the non-Saudi teachers were reported to have a non-significant effect size among the teachers in the 18-25 year age category (see Table 11.32 in Appendix B). However, a closer observation of the effect size trends shows that only the non-Saudi teachers were reported to have a strong positive trend (see Figure 11-11 in Appendix B). This meant that as age increases among the non-Saudi teachers, the effect of Subjective Norm on Behavioural Intention to use the Noor system becomes strong. There was a minimal increase in this trend for the Saudi students. There was a decline in the effect size trend for the non-Saudi parents, non-Saudi students, Saudi teachers, and the Saudi parents. This meant that as age increases, the effect of Subjective Norm on the Behavioural Intention to use the Noor system becomes weaker. Thus, it was concluded that age only plays a major role in influencing the non-Saudi teachers' intentions to use the Noor system. Older teachers are more likely to be encouraged by other teachers to use the Noor system.

8.4.1.1.2. Gender

The effect size findings for gender showed varied results. All the effect size findings shown in Table 11.33 in Appendix B were significant. The most notable findings were observed among the teachers. The effect size for the female teachers was higher than for their male counterparts. The non-Saudi female teachers had the highest significant effect size compared to the other categories. This meant that the effect of Subjective Norm on Behavioural Intention among non-Saudi female teachers was very strong, meaning that their Behavioural Intention to use the Noor system was highly dependent on the influence of Subjective Norm. However, the current study was not able to investigate whether there was any cultural influence among the non-Saudi female teachers that increased the effect size of Subjective Norm on Behavioural Intention compared to other categories. Nevertheless, a closer observation of the parents and the students of both nationalities revealed that the males were more influenced by Subjective Norm compared to the females. Thus, it was concluded that the non-Saudi female teachers had the strongest influence on the relationship between Subjective Norm and Behavioural Intention, especially under the mandatory setting.

8.4.1.1.3. Use of Noor Help and Support

The literature suggests that the more people receive help and support in using a system, the more likely they are to be confident in using it. This study investigated whether Noor help and support had any significant effect size on the relationship between Subjective Norm and Behavioural Intention. Overall, the findings shown in Table 11.34 in Appendix B showed that, of the three groups of participants, the effect sizes were much higher for the respondents who acknowledged using Noor help and support. Nevertheless, using Noor help and support had the highest effect size among the Saudi teachers, compared to the non-Saudi teachers. The same findings were observed among the Saudi parents and students. Thus, it was concluded that using the Noor system's help and support had the highest effect size on the relationship between Subjective Norm and Behavioural Intention under the mandatory setting, where its effect was much stronger among the Saudis compared to the non-Saudi .

8.4.1.1.4. Internet Access at Home

The Noor system is an online platform that is dependent on the availability of the Internet services. Thus, having access to the Internet is essential in order to enable Noor system users to access its services. The investigation of Internet access at home in this study required the selection of a binary response, namely ‘yes’ or ‘no’. The most notable finding was that the Behavioural Intention to use the Noor system of participants who did not have Internet access at home was influenced much more by Subjective Norm (see Table 11.35 in Appendix B). The effect size was much higher for Saudi teachers, making the effect size much higher under the mandatory setting. It was thus concluded that the effect of Subjective Norm on Behavioural Intention to use the Noor system is much higher for the participants who do not have Internet access at home, especially Saudi teachers under the mandatory setting.

8.4.1.1.5. Internet Experience

Internet experience can have some influence on the use of an information technology system. This fact was investigated by examining Internet experience, which ranged from less than six months to over 12 years of experience for the teachers, students, and parents among both the Saudis and non-Saudis. The findings shown in Table 11.36 in Appendix B reveal that as Internet experience increases, the effect size of Subjective Norm on Behavioural Intention to use the Noor system becomes weaker for all nationalities. It was thus concluded that the effect of Subjective Norm on Behavioural Intention becomes weaker as Internet experience increases, especially among the Saudi teachers, where its effect becomes much weaker under the mandatory setting compared with the voluntary setting. As Internet experience increases, the effect of Subjective Norm on Behavioural Intention becomes weaker.

8.4.1.1.6. Internet Proficiency

Internet proficiency makes the use of an IT system easier. Internet proficiency was investigated using a six-point ordinal scale: very low, low, satisfactory, good, very good, and excellent (see Table 11.37 in Appendix B). These findings revealed that as Internet proficiency increases, the effect of Subjective Norm on Behavioural Intention becomes significantly weaker, especially among non-Saudi teachers, non-Saudi parents, Saudi teachers, Saudi students, and Saudi parents. This led to the conclusion that as Internet proficiency increases, the effect of Subjective Norm on Behavioural Intention becomes significantly weaker, especially among non-Saudi teachers, non-Saudi parents, Saudi teachers, Saudi students, and Saudi parents. However, a contradictory finding was observed among the non-Saudi students. As Internet proficiency increased, the effect of Subjective Norm on Behavioural Intention became significantly stronger (see Figure 11-12 in Appendix B). This led to the conclusion that as Internet proficiency increases, the effect of Subjective Norm on Behavioural Intention becomes significantly stronger, especially among the non-Saudi students.

8.4.1.1.7. Average Time Spent Using the Internet

The average time spent using the Internet daily was investigated using a 5-point ordinal scale: less than 30 minutes, 30 minutes to one hour, one to two hours, two to three hours, and more than three hours. The overall findings shown in Table 11.38 in Appendix B show that as the average time spent using the Internet increases, the effect of Subjective Norm on Behavioural Intention becomes significantly weaker. This was reported among the non-Saudi teachers, the non-Saudi students, the non-Saudi parents, the Saudi students, and the Saudi parents. Nevertheless, the finding for the Saudi teachers showed that as the average time spent using the Internet increases, the effect of Subjective Norm on Behavioural Intention becomes significantly stronger (see Figure 11-13 in Appendix B).

8.4.1.1.8. Education Level

The educational level of both the parents and the teachers was investigated to determine whether there was any correlation between educational level and the effect size of the Subjective Norm on Behavioural Intention to use the Noor system, as shown in Table 11.39 on Appendix B. The effect of the Subjective Norm on Behavioural Intention among the non-Saudi teachers was found to strongly increase with an increase in educational level, as shown in Figure 11-14 in Appendix B. However, the increase among the Saudi teachers was slight, meaning that the effect of Subjective Norm on Behavioural Intention among the Saudis was small, as shown in Figure 11-15 in Appendix B. Thus, it was concluded that the effect of Subjective Norm on Behavioural Intention among the non-Saudi teachers strongly increases with an increase in educational level under the mandatory setting.

Nevertheless, the effect of Subjective Norm on Behavioural Intention was found to become weaker with an increase in the educational level, as shown in Figure 11-16 (Saudi teachers), and Figure 11-17 (non-Saudi parents). Thus, it was concluded that the effect of Subjective Norm on Behavioural Intention to use the Noor system becomes weaker with an increase in educational level only among Saudi teachers and non-Saudi parents.

8.4.1.1.9. Monthly Income

Monthly income was also investigated to determine whether it had any effect on the relationship between Subjective Norm and Behavioural Intention to use the Noor system. One of the most notable findings, as shown in Table 11.40 on Appendix B, was that in the sample investigated in the current study, no non-Saudi teachers had a monthly income in excess of SR11,999. Nevertheless, the effect of Subjective Norm on Behavioural Intention was found to strongly increase with an increase in income among the non-Saudi teachers, as shown in Figure 11-18 in Appendix B. Similarly, a slight increase was observed among the non-Saudi parents (see Figure 11-19 in Appendix B). This led to the conclusion that the effect of Subjective Norm on Behavioural Intention to use the Noor system increases with an increase in monthly income among the non-Saudis; the effect is strong under the mandatory setting.

The most notable findings were observed among the Saudis. These findings for the Saudi teachers and Saudi parents showed that the effect of Subjective Norm on Behavioural Intention to use the Noor system becomes weaker with an increase in monthly income, as shown in Figure 11-20 and Figure 11-21 in Appendix B. Thus, it was concluded that an increase in monthly income has a weaker effect on the relationship between Subjective Norm and Behavioural Intention to use the Noor system.

8.4.1.1.10. Employment Region

Six employment regions were investigated in the current study: the central region, the western region, the eastern region, the northern region, the southern region, and the diaspora. The diaspora represented parents and teachers based outside the KSA used the Noor system. Overall, as shown in Table 11.41 in Appendix B, the Saudi teachers from the southern region had the highest significant effect size on the relationship between Subjective Norm and Behavioural Intention. However, for the non-Saudi teachers, the effect size was much higher among those whose jobs were in the eastern region. Thus, it was concluded that the highest significant effect size of Subjective Norm on Behavioural Intention to use the Noor was among the Saudi teachers under the mandatory setting. Regarding parents, the Saudi parents recorded the highest effect. This meant that the Behavioural Intention to use the Noor system among the parents working in the diaspora was highly influenced by Subjective Norm. However, among the non-Saudi parents, the influence was much higher among those employed in the northern region.

8.4.1.1.11. Internet Access at Work

The availability of Internet access at work for both parents and teachers can influence the extent to which people are able to browse the internet or use an IT system. The participants who did not have Internet access at work recorded the highest effect size in the relationship between Subjective Norm and Behavioural

Intention. In this case, the non-Saudi Teachers had the highest effect size at 50%, as shown in Table 11.42 in Appendix B. With regard to Behavioural Intention to use the Noor system, non-Saudi teachers who did not have Internet access at work were more likely to be influenced by the Subjective Norm compared to those who had Internet access at work. Nevertheless, among the parents, the effect was much higher among Saudis (39%) compared to non-Saudis. Thus, it was concluded that under the mandatory setting, lack of Internet access at work would significantly influence the effect of Subjective Norm on Behavioural Intention to use the Noor system, although the effect would be much higher among the non-Saudi teachers compared to their Saudi counterparts.

8.4.1.1.12. Attending Noor System Training

Attending Noor system training can be very useful, as it enables users of the Noor system, especially new users, to obtain relevant knowledge and skills. Attending training was measured using binary responses, namely ‘yes’ or ‘no’. This question was assessed among the three groups of participants, who were categorised according to their nationality. Overall, the findings shown in Table 11.43 in Appendix B clearly indicate that attending Noor system training had the highest effect size compared with not attending any Noor system training. Non-Saudi teachers had the highest effect size compared with Saudi teachers under the mandatory setting. Nevertheless, under the voluntary setting, the effect size was much stronger for the Saudis who had attended Noor system training compared to the non-Saudis. It was thus concluded that, under the mandatory setting, attending the Noor system training significantly influences the effect of Subjective Norm on Behavioural Intention to use the Noor system, The effect was much higher among non-Saudi teachers compared to their Saudi counterparts.

8.4.1.1.13. Receiving Support with a Noor Account

Receiving guidance, help and support when registering for a Noor system account for the first time is very important, as new users of the system are likely to perceive it to be useful and easier to use. Similarly, more users are likely to accept the system as they will be confident of receiving support should they encounter any difficulties while using the system or accessing their accounts. Binary responses were used to assess receiving support with a user's Noor system account. All the effect sizes, as shown in Table 11.44 in Appendix B, were significant. The effect size was high for Saudi teachers who did not receive any support with their Noor system account. This led to the conclusion that the Behavioural Intention among Saudi teachers who have never received any support with their new Noor system account was highly likely to be influenced by the Subjective Norm. However, the findings for the Saudi parents and students were contradictory, as the effect sizes were stronger among those who had received support with their Noor system account. Thus, it is predicted that receiving support with the Noor system account is moderately significant under the mandatory setting among Saudi teachers.

8.4.2. Group/ Nationality/Gender/Education (Behavioural Intention ← Subjective Norm X Experience

In summarising the role played by demographic variables in the use of the Noor system, several interactions were investigated. These relate to the two-way and three-way interactions of Subjective Norm, Experience and Voluntariness on Behavioural Intention.

8.4.2.1. Teachers

The first demographic interaction was developed using the groups (teachers, students and parents), nationality, gender, and educational level, as shown in Table 11.45 in Appendix B. These findings show that non-Saudi female teachers holding a Bachelor's degree had the highest significant effect size compared to the other categories. This led to the conclusion that, under the mandatory setting, the effect of Subjective Norm and Experience on Behavioural Intention to use the Noor system is moderate among non-Saudi female teachers with a Bachelor's degree.

8.4.2.2. Parents

When comparing the parent participants, as shown in Table 11.46 in Appendix B, the non-Saudi males with an intermediate level of education reported the highest effect size compared with their counterparts. Although the other participants had some significant effect sizes, the effects were negligible. This prompted the conclusion that, under the voluntary setting, the effect of Subjective Norm and Experience on Behavioural Intention to use the Noor system is moderate among non-Saudi male parents with an intermediate level of education.

8.4.3. Teachers: Subjective Norm X Experience X Voluntariness

The effect of Subjective Norm, Experience, and Voluntariness was also investigated in relation to nationality, gender and educational level. The majority of interactions, as shown in Table 11.47 in Appendix B, had insignificant effect sizes, while most of those that were significant had a negligible effect. Nevertheless, a weak significant effect size was observed among Saudi male teachers with a diploma degree. Thus, it was concluded that, under the mandatory setting, the effect of Subjective Norm, Experience and Voluntariness on Behavioural Intention to use the Noor system is much stronger among Saudi male teachers with a diploma degree compared with those who with a different level of education.

8.4.4. Parents: Subjective Norm X Experience X Voluntariness

Among the non-Saudi parents, the effect size on the three-way interaction of Subjective Norm, Experience, and Voluntariness on Behavioural Intention was significantly moderate among the male parents with an intermediate school level of education. Nevertheless, the effect size among the Saudi parents was significantly higher compared to the non-Saudi parents. The effect size on the male Saudi parents who had a primary level of education was significantly higher compared to the Saudi female parents, the non-Saudi males, and the non-Saudi female parents. This led to the conclusion that, under the voluntary setting, the effect of Subjective Norm, Experience and Voluntariness on Behavioural

Intention to use the Noor system is very strong among Saudi male parents with a primary level of education (see Table 11.48 in Appendix B).

8.4.5. Group/ Nationality/ Gender/ Experience using Noor (Behavioural Intention ← Subjective Norm X Experience X Voluntariness)

Similarly, the effect of Subjective Norm, Experience, and Voluntariness on Behavioural Intention was investigated in relation to the nationality, gender, and experience using the Noor system. It was worth investigating experience using the Noor system as it was predicted that it would have a significant influence. The findings presented in Table 11.49 in Appendix B show that the effect size for the parents and the teachers was negligible. Nevertheless, a moderate effect size was observed among the male Saudi teachers who had between six and 12 months' experience of using the Noor system. This led to the conclusion that under the mandatory setting, the effect of Subjective Norm, Experience, and Voluntariness on Behavioural Intention to use the Noor system is moderate among male Saudi teachers with between six and 12 months' experience of using the Noor system.

8.4.6. The Effect Size of Perceived Usefulness on Behavioural Intention (H2)

8.4.6.1. Gender

Regarding the effect sizes on the teachers, the findings showed that the effect of gender on the relationship between Perceived Usefulness and Behavioural intention was much stronger among the female teachers compared to the male teachers. However, the effect was much stronger among the non-Saudi female teachers compared to the Saudi female teachers, and much stronger for the Saudi teachers compared with the non-Saudi teachers. The male students had a much higher effect size compared to the female students. Nevertheless, the effect size was much higher among the Saudi male students compared to the other students. Likewise, the effect sizes were much stronger among the male than female parents for both nationalities. However, the effect was much stronger among the male Saudi parents compared with the non-Saudi parents. Thus, it was concluded that the effect size on the relationship between Perceived Usefulness and Behavioural Intention was much stronger under the mandatory setting, especially among the non-Saudi female teachers (see Table 11.56 in Appendix I).

8.4.6.2. Age

The effect size of Perceived Usefulness on Behavioural Intention was found to increase slightly with an increase in age among the Saudi and non-Saudi teachers. Regarding the students, the effect size of Perceived Usefulness on Behavioural Intention was weaker among non-Saudis with an increase in age. However, for the Saudi students, the effect size became stronger with an increase in age. The effect size on the parents became weaker as age increased for both nationalities (see Table 11.57 in Appendix I).

8.4.6.3. Education Level

The effect size of Perceived Usefulness on Behavioural Intention was found to become weaker with an increase in educational level amongst Saudi and non-Saudi parents. However, among the teachers, the effect was weaker among the Saudis. The effect size of the non-Saudi teachers became slightly stronger with an increase in educational level (see Table 11.58 in Appendix I).

8.4.6.4. Experience Using the Noor System

The effect size of Perceived Usefulness on Behavioural Intention was found to become weaker as users gained experience using the Noor system for all parents, all students, and non-Saudi teachers. However, the effect sizes were much weaker for the non-Saudi students and parents. Saudi teachers were the only category for which the effect size became slightly stronger with an increase in experience of using the Noor system (see Table 11.59 in Appendix I).

8.4.6.5. Internet Proficiency

The effect size of Perceived Usefulness on Behavioural Intention was found to become weaker with an increase in Internet proficiency, although the effect was much weaker among Saudi teachers compared with non-Saudi teachers. For students, the effect size was much weaker for non-Saudis as Internet proficiency increased. However, the effect was stronger among Saudi students, and increased alongside Internet proficiency. When testing the effect of Perceived Usefulness on Behavioural Intention, only the Saudi students had a strong influence. The other categories had weaker effects (see Table 11.60 in Appendix I).

8.4.6.6. Internet Experience

Most of the categories of Internet experience showed that as it increases, the effect size of Perceived Usefulness on Behavioural Intention becomes weaker. For the teachers, the effect was much weaker among Saudis compared with non-Saudis. Likewise, the effect was weaker for both sets of parents, and much weaker among the non-Saudi parents compared with the Saudi parents. The effect on the non-Saudi students became weaker with an increase in Internet experience. However, for Saudi students, as Internet experience increases, its effect size on the relationship between Perceived Usefulness and Behavioural Intention became slightly stronger. A comparison of the magnitude of the effect size concluded that Internet experience had a stronger effect on the relationship between Perceived Usefulness and Behavioural Intention under the mandatory settings, especially among Saudi teachers (see Table 11.61 in Appendix I).

8.4.7. The Effect Size of Perceived Ease of Use on Behavioural Intention (H3)

8.4.7.1. Gender

The effect size of gender on the relationship between Perceived Ease of Use on Behavioural Intention was much stronger among non-Saudi female teachers compared with the other groups and nationalities investigated in this study. A comparison of the teachers showed that the effect size was much stronger among the female teachers compared with the male teachers. Regarding the students, the effect size was much higher for the males, and much higher for the non-Saudi than Saudi males. The Saudi female parents had the highest effect size among the parents' category. Thus, it was concluded that the effect size of gender on the relationship between Perceived Ease of Use and Behavioural Intention is stronger under the mandatory settings and especially among non-Saudi female teachers (see Table 11.62 in Appendix J).

8.4.7.2. Age

The effect size of Perceived Ease of Use on Behavioural Intention among the teachers was found to become weaker with an increase in age, although the effect was much weaker for the non-Saudi teachers compared with the Saudi teachers. However, the effect size was much stronger for the students of both nationalities, although the effect was much stronger among the non-Saudis compared with the Saudis. Regarding the parents, the effect sizes became weaker with an increase in age, although the effect was much weaker for the non-Saudis compared with the Saudis (see Table 11.63 in Appendix J).

8.4.7.3. Education Level

The level of education had opposite trend lines among the teachers. The effect size of Perceived Ease of Use on Behavioural Intention became slightly stronger with an increase in education level among non-Saudi teachers. However, the effect of Perceived Ease of Use on Behavioural Intention became much weaker with an increase in education level among the Saudi teachers. Likewise, among the parents, the effect size of Perceived Ease of Use on Behavioural Intention became weaker with an increase in education level. However, the effect was much weaker among non-Saudi parents compared with Saudi parents (see Table 11.64 in Appendix J).

8.4.7.4. Experience Using the Noor System

The effect size on experience of using the Noor system with the relationship between Perceived Ease of Use and Behavioural Intention showed different trends with an increase in experience. The effect was weaker among the teachers, and was much weaker among the non-Saudi teachers compared with the Saudi teachers. Likewise, the effect was weaker among the students, although the effect was much weaker among the non-Saudi students compared with the Saudi students. Regarding the parents, for the non-Saudis, the effect of experience of using the Noor system was much weaker; as the level of experience increases, its effect on the relationship between Perceived Ease of Use on Behavioural Intention becomes weaker. However, the scenario was different among the Saudi parents. As the level of experience of using the Noor system increases, the effect of Perceived Ease of Use on Behavioural Intention became slightly stronger (see Table 11.65 in Appendix J).

8.4.7.5. Internet Proficiency

For Internet proficiency, there were weaker effect sizes among all the groups and nationalities. A comparison of the teachers showed that the effect size of Perceived Ease of Use on Behavioural Intention was much weaker among the Saudi teachers compared with non-Saudi teachers. As Internet proficiency increases, the effect of Perceived Ease of Use on Behavioural Intention became much weaker among the Saudi teachers. For students, as Internet proficiency increased, the effect size became weaker for both nationalities. Although there were few differences in the effect sizes for the students, it was concluded that the effect size was slightly weaker for the Saudis compared with the non-Saudis. Likewise, the effect size for parents of both nationalities became weaker with an increase in Internet proficiency. However, it is worth noting that the effect size for Perceived Ease of Use on Behavioural Intention was much weaker for the non-Saudi parents compared with the Saudi parents. This led to the conclusion that under both the mandatory and voluntary settings, the effect size of Perceived Ease of Use on Behavioural Intention became weaker as Internet proficiency increased amongst both Saudis and non-Saudis in the three groups investigated in the Noor system study (see Table 11.66 in Appendix J).

8.4.7.6. Internet Experience

Overall, the effect size of Internet experience on the relationship between Perceived Ease of Use and Behavioural Intention showed that as Internet experience increases, its effect becomes weaker. Among the three groups investigated, it was obvious that as Internet experience increases, its effect size becomes weaker in the relationship between Perceived Ease of Use and Behavioural Intention. For teachers, the effect was much weaker among the non-Saudi teachers compared with the Saudi teachers. Likewise, the effect was much weaker among the non-Saudi students compared with the Saudi teachers. Similarly, the effect was much weaker among the non-Saudi parents when compared with the Saudi parents. These findings show that the effect size was much weaker among the non-Saudis compared with the Saudis. Therefore, it was concluded that the effect of Perceived Ease of Use on Behavioural Intention becomes weaker as Internet experience increases. Overall, the magnitude of the effect size was much weaker among the non-Saudi teachers, which led to the conclusion that the effect was much weaker under the mandatory setting compared with the voluntary settings (see Table 11.67 in Appendix J).

8.5. Investigating the Influence of Saudi Culture (Subjective Norm) on Behavioural Intention and Perceived Usefulness of the Noor System.

The fourth objective was investigated by comparing the influence of Saudi culture (Subjective Norm) on Behavioural Intention and Perceived Usefulness of the Noor system. This can be clearly explained by comparing these respective relationships with the studies by Venkatesh and Bala (2008); Al-Gahtani (2016), as shown in Table 11.1 in Appendix A.

The findings on the Noor system were obtained by testing the relationship between Subjective Norm and Behavioural Intention in H5. The comparative findings show that the influence of Subjective Norm on Behavioural Intention was slightly stronger in the study by Al-Gahtani (2016) (β = .35) compared to the current Noor system study (β = .338). These findings were compared with Venkatesh and Bala (2008), who reported (β = .02), clearly confirming that Subjective Norm has the strongest influence, not only on the use of the Noor system but also on the adoption of new technologies.

H2 was used to investigate the relationship between Perceived Usefulness and Behavioural Intention. The findings show that the influence of Perceived Usefulness on Behavioural Intention was stronger in the study by Al-Gahtani (2016) (β = .37) compared to the current Noor system study (β = .212). Nevertheless, the sample size for the Noor system study was N=10,711 compared with the very small size used in Al-Gahtani (2016) (N=286), which could have resulted in some sampling errors. These findings prompt the conclusion that Perceived Usefulness does not have the strongest influence on the use of the Noor system; instead, Perceived Ease of Use has the strongest influence on Behavioural Intention in the adoption of the Noor system. However, in the Western context, Venkatesh and Bala (2008) reported that Perceived Usefulness has the strongest influence on Behavioural Intention when compared with Perceived Ease of Use (see Table 5.6).

In summary, the fourth objective was adequately investigated. It was concluded that the influence on the Saudi culture (Subjective Norm) has the strongest effect on the Behavioural Intention and Perceived Usefulness of the Noor system.

8.6. Investigating the Effect of Retention or Deletion of Use Behaviour as the Main Dependent Variable in the Technology Acceptance Model 3 Under a Self-Reported System Usage

The findings on the *beta* estimates of the effect of Perceived Usefulness on Behavioural Intention, and Perceived Ease of Use on Behavioural Intention, showed a change in their values but not their signage following the removal of the Use Behaviour construct. Regarding the teachers' data, the *beta* value for the effect of Perceived Usefulness on Behavioural Intention decreased, while the value for Perceived Ease of Use on Behavioural Intention increased. The data for the parents showed a decrease in the *beta* values for both Perceived Usefulness on Behavioural Intention, and Perceived Ease of Use on Behavioural Intention. Lastly, the students' data showed an increase in the *beta* value for Perceived Usefulness on Behavioural Intention and a decrease on Perceived Ease of Use on Behavioural Intention. Therefore, these findings rejected H18b. It was concluded that the *beta* estimate for the relationship between Perceived Ease of Use and Behavioural Intention will change when Use Behaviour is removed from the TAM 3 under the self-reported usage system. Likewise, H18d was rejected. It was concluded that the *beta* estimate for the relationship between Perceived Usefulness and Behavioural Intention will change when Use Behaviour is removed from TAM 3 under the self-reported usage system.

The p values for the effect of Perceived Usefulness on Behavioural Intention and Perceived Ease of Use on Behavioural Intention remained significant. Thus, based on these findings, H18a was rejected. It was concluded that Perceived Ease of Use will continue to have a significant effect on Behavioural Intention when Use Behaviour is removed from the TAM 3 under the self-reported usage system. Similarly, H18c was rejected and it was concluded that Perceived Usefulness will retain a significant effect on Behavioural Intention when Use Behaviour is removed from the TAM 3 under the self-reported usage system.

The explained variance (R-squared value) in any analysis is very important, as it explains the amount of variance that the independent variable contributes to the dependent variable. The literature review has already been explained that Behavioural Intention is primary determinant in the Technology Acceptance Model, while Perceived Ease of Use and Perceived Usefulness are the two secondary determinants. Based on these facts, the explained variance in Behavioural Intention, Perceived Ease of Use, and Perceived Usefulness were investigated. Behavioural Intention showed a decrease in the explained variance following the removal of the Use Behaviour construct. The explained variance for Perceived Ease of Use and Perceived Usefulness did not change. Therefore, H19a and 19b were retained. However, H19c was rejected and it was concluded the removal of the Use Behaviour construct will decrease the explained variance in Behavioural Intention in the TAM 3 under the self-reported usage system. Similarly, it was concluded that the removal of Use Behaviour in the TAM 3 will not change the explained variance in perceived ease of use and perceived usefulness because the two do not have a direct link with Use Behaviour.

8.7. Likewise, the removal of the Use Behaviour construct from the TAM 3 was found to increase only the range on Behavioural Intention factor loadings. This can be attributed to the direct link the it shares with Use Behaviour in TAM 3. Lastly, the effect of Perceived Ease of Use on Perceived Usefulness was reported to be strongest under the mandatory setting (teachers) compared to the voluntary setting (parents and students). This can be attributed to the strong cultural background in the KSA that would envisage Perceived Ease of Use to have the strongest effect in the TAM 3 compared to Perceived Usefulness. Therefore, the findings presented in this section are in agreement with Bagozzi (2007), who stated that the Technology Acceptance Model is a completely deterministic model; when an independent variable increases (decrease), the dependent variable is expected to increase (decrease).Conclusion

The five objectives outlined in Chapter 1 were adequately tested. The discussed findings were analysed using multigroup analysis in AMOS, and univariate analysis was carried out using SPSS. Informative comparative conclusions were discussed in terms of each specific hypothesis. Each hypothesis had its own inference and conclusion. The most notable aspect of this section was that the findings on the Noor system were compared with two studies that adopted the ‘full’ TAM 3.

To conclude, each relationship in the Noor system study was determined by comparing the effects of the relationships with two studies. One was carried out in the Western context, and the other was in the Saudi context. The relationships were compared in terms of two nationalities: Saudis, and non-Saudis. These findings were worth the effort that was required to conduct this study. One notable question that arises from this research is why the Noor findings were only compared with two other studies, namely Venkatesh and Bala (2008) (Western context), and Al-Gahtani (2016) (Saudi context). This was because after conducting a thorough literature review, these were the only studies that were found to have adopted the 'full' TAM 3; representing the Western and the Saudi context. The word 'full' was deliberately chosen because Al-Gahtani (2016) did not investigate Objective Usability, which is one of the main determinants of Perceived Ease of Use in the TAM 3. Likewise, although the Noor study investigated Objective Usability, the findings were not found to be credible, as this construct was only investigated in an experimental setup. Therefore, this study, together with the studies by Venkatesh and Bala (2008) and Al-Gahtani (2016) had similarities and differences that merited comparison.

Lastly, the next chapter describes the contributions that this study has made in comparison with the literature on the TAM 3. Significant contributions have been outlined with respect to all the relationships that were stated in Chapter 3 and investigated in Chapter 6. These contributions are interesting as this study estimated the effect sizes of some selected socio-demographics regarding cultural influence, especially on the influence of Subjective Norm on Behavioural Intention. The data analysed on the effect sizes was segregated according to nationality and compared between teachers, parents, and students. Significant differences were reported between the non-Saudis and Saudis. The only limitation on the effect size was that the findings could not be generalised to state whether the non-Saudis were Arabs. There are many migrant workers in the KSA whose children are enrolled in the country's education system. This means that if they are in state schools, the parents and children of these migrant workers have no option other than to embrace the Noor system. It would thus be inaccurate state that the non-Saudis in this study were exclusively Arabs from other Middle Eastern countries. Future studies would be appropriate, especially if they specified the actual nationalities of the respondents. This would permit a comparison of the findings between Saudi Arabs and other non-Saudi Arabs, and probably other nationalities resident in the KSA.

9 CHAPTER NINE: CONTRIBUTIONS OF THE STUDY

9.1. Introduction

This chapter discusses the contribution of the research results regarding the use of the Noor system in the KSA. Arabic is the main teaching language at primary, intermediate and the secondary school levels, and the KSA attracts immigrants from other Middle Eastern countries. Thus, this section also presents the contributions from the results regarding the overview of the Noor system among Saudis and the non-Saudis. In addition, there will be a comparison between the results of the Noor system and studies done by Venkatesh and Bala (2008); Al-Gahtani (2016) was reviewed to determine the gaps identified as contributions to the current study.

9.2. Contributions of the Study in Relation to the main Constructs and Determinants in the Technology Acceptance Model 3

Five main objectives were stated for the current study, and investigated using the Maximum Likelihood Estimate, moderation testing, and effect size estimates using univariate analysis. Several contributions were identified and are outlined below;

1. The full TAM 3 has five main constructs; namely Perceived Ease of Use, Perceived Usefulness, Image, Behavioural Intention, and Use Behaviour. The comparative findings of the Noor system study, and the study conducted by Al-Gahtani (2016), which used the TAM 3, clearly showed that only the Noor system measured all five of the main constructs under one study. Therefore, the study of the Noor system measured Use Behaviour filling in the gap left by Al-Gahtani (2016).

2. The Noor system model was found to be a much better predictor of variance explained in terms of Perceived Ease of Use compared to

Venkatesh and Bala (2008); Al-Gahtani (2016) as it explained 65% of the variance in the full model. Furthermore, three models were estimated on the Noor system, the teachers model being one, the students model being the second, and the parents model, which had higher predictions of variance in terms of Perceived Ease of Use compared with the variances, Venkatesh and Bala (2008); Al-Gahtani (2016) obtained in their studies.

3. The Noor system model reported a higher explained variance on Perceived Usefulness than the findings reported by Venkatesh and Bala (2008) and Al-Gahtani (2016), which had the least explained variances for Perceived Usefulness. Likewise, the teachers sample had a larger variance compared with the above mentioned studies. Besides, Al-Gahtani (2016) conducted his study in the KSA, although his findings on both Perceived Ease of Use and Perceived Usefulness were significantly lower when compared to the findings reported on the Noor system study. A concern was identified in terms of the sample size Al-Gahtani (2016) used for his study, which could have resulted in lower explained variances. The Noor system can thus be considered the better predictor of Perceived Ease of Use and Perceived Usefulness, due to the fact that the sample size for the Noor system was N= 10,711, compared to N=286 for Al-Gahtani (2016). It was then concluded that the larger the sample size, the greater the explained variances on Perceived Ease of Use and Perceived Usefulness in a non-Western context, especially in the KSA.

4. Overall the Noor system model reported an influence from Behavioural Intention on Use Behaviour H1, having the strongest significant influence under the non-Western (β = .608) context compared with the Venkatesh and Bala (2008) study, which was conducted in a Western context (β = .59). Thus, the Noor system study contributes to H1 by showing the influence of Behavioural Intention on Use Behaviour, and H1 is slightly stronger in the non-Western context than in the Western context. Moreover, Al-Gahtani (2016) did not investigate this relationship, showing that the Noor system was able to identify and fill in the gap in the non-Western context. Another notable finding relating

to H1, concerned the comparative results in terms of nationalities. Subjective Norm was found to have the strongest effect on Behavioural Intention among non-Saudi teachers. This was not predicted, as Saudis are believed to be subject to very strong cultural influence. Thus, the Noor study shows that the effect of Subjective Norm on Behavioural Intention is strong among non-Saudi teachers in a mandatory setting, when compared to their Saudi counterparts.

5. The influence of Perceived Usefulness on Behavioural Intention H2 was reported to have the strongest significant influence in a mandatory setting. However, the most notable finding was that the effect size of Perceived Usefulness on Behavioural Intention was higher among non-Saudi teachers (55%) compared to the Saudi teachers (51%). This phenomenon is unexpected, considering that the Saudis have a strong cultural background. Therefore, this is a significant contribution, requiring further investigation in the future; certainly, it suggests researchers should not assume that Saudi cultural background always has a stronger influence on H2 than on non-Saudi from elsewhere in the Middle East.

6. The influence of Perceived Ease of Use on Behavioural Intention H3 was found to have the strongest significant influence in a voluntary setting. All the *Beta* estimates were higher compared to reports by Al-Gahtani (2016) (β = .25). That is, the Students (β = .368), the Teachers (β = .287) and the Parents (β = .288). These findings identified a gap that was later addressed by the larger sample size employed in the Noor study. Besides, the overall Noor system model had (β = .306). These findings led to the discovery that, as sample size increases, the *Beta* estimate of the relationship between Perceived Ease of Use and Behavioural Intention also increases, especially in a non-Western context. The effect size from Perceived Ease of Use on Behavioural Intention was another notable finding from H3, because effect size was found to be higher among non-Saudis under the mandatory setting. This led to the finding that in a mandatory setting non-Saudis experienced the strongest influence from

Perceived Ease of Use on Behavioural Intention, when compared to their Saudi counterparts.

7. The two-way interaction between Perceived Ease of Use and Experience on Behavioural Intention H3a, reported that as Experience using the Noor system increases, the effect of Perceived Ease of Use on Behavioural Intention weakens. This statement was observed among non-Saudi teachers, non-Saudi students, non-Saudi parents, Saudi teachers, and Saudi students. These findings confirmed those in Venkatesh and Bala (2008) study, which was conducted in a Western context, and reported that the effect of Experience on H3 becomes weaker as Experience increases. A positive contribution was reported for H3, that was contrary to other findings; that is, as Experience using the Noor system increases, the effect of Perceived Ease of Use on Behavioural Intention becomes moderately strong among Saudi parents.

8. The influence of Perceived Ease of Use on Perceived Usefulness H4 was found to have the strongest significant influence in a mandatory setting in the non-Western context. By using a large sample size, and researching three groups simultaneously, the Noor system contributes to H4 by showing that with a larger sample size, the *Beta* estimate for influence of Perceived Ease of Use on Perceived Usefulness in a non-Western context would be higher compared to that already reported by Al-Gahtani (2016) in his study undertaken in the KSA. Regarding nationalities, a notable contribution from effect size for non-Saudi teachers (70%) was found to be greater compared to that for Saudi teachers (61%). Therefore, in a mandatory setting, the influence of Perceived Ease of Use on Perceived Usefulness is strong among non-Saudis compared to Saudis.

9. Venkatesh and Bala (2008) study reported that the effect of two-way interaction of Perceived Ease of Use and Experience on Perceived Usefulness H4a was strengthened with increases in Experience. The notable contribution from H4a was that the effect size of Experience when using the Noor system in the KSA context (mandatory setting) was

found to be weaker with an increase in Experience in contrast to Western culture. Nevertheless, the effect size from a non-Saudi perspective was similar to that reported by Venkatesh and Bala (2008), who found the effect of Perceived Ease of Use on Perceived Usefulness was strengthened by an increase in Experience.

10. Regarding the effect of Subjective Norm on Behavioural Intention when using the Noor system H5, the effect proved to be much stronger in the voluntary setting. Some previous contributions that have been highlighted above suggest non-Saudi experience strong effects in this regards. However, this is not the case in terms of the effect of Subjective Norm on Behavioural Intention, because the effect on the three groups was much stronger among Saudis than non-Saudi. Therefore, it is considered a notable contribution that the Noor system study confirmed a strong Saudi cultural background has a stronger effect on H5 than a non-Saudi background.

11. The two-way interaction of Subjective Norm and Experience on Behavioural Intention H5a confirmed Al-Gahtani (2016) finding that as Experience increases, the moderation effect is weakened among Saudis. These findings are in contrast with Venkatesh and Bala (2008), which reported no moderation effect in the Western context. After reviewing the findings for non-Saudis, the findings were found to be similar to those for Saudis. This is a notable contribution, clarifying that irrespective of nationality, when participants are mainly from the Middle Eastern countries , as their Experience using the system increases the effect from the Subjective Norm on Behavioural Intention will be weakened.

12. The effect of Subjective Norm and Voluntariness on Behavioural Intention H5b within a voluntary setting made a notable contribution in terms of effect in the KSA. Al-Gahtani (2016) study in the KSA, did not test the general role of Voluntariness on interactions between Subjective Norm and Behavioural Intention; the findings were generalised with respect to the voluntary setting. Furthermore, Venkatesh and Bala (2008)

reported that Voluntariness had no significant moderating effect on Behavioural Intention in Western culture based on their pooled results. The Noor system study noted the effect of Voluntariness on the relationship between Subjective Norm and Behavioural Intention as having a weaker significant effect. Regarding nationalities, the interaction effect between Voluntariness and Subjective Norms on Behavioural Intention H5b was negligibly higher among non-Saudi parents in the voluntary setting, when compared to Saudi parents.

13. Regarding H5c, the effect of Subjective Norm and Voluntariness on Behavioural Intention was investigated in a mandatory setting. Studies conducted by Venkatesh and Bala (2008) and Al-Gahtani (2016) did not investigate this relationship in Western and non-Western contexts respectively. Nevertheless, the study of the Noor system investigated the relationship under the mandatory setting, and contributed to literature on the TAM 3, which reported that Voluntariness had negative significant moderating effect on the relationship between Subjective Norm and Behavioural Intention, under the mandatory settings in the Noor system study.

14. A three-way moderation interaction within the mandatory setting was investigated using Voluntariness and Experience as the two moderators on the relationship between Subjective Norm and Behavioural Intention H5d. Venkatesh and Bala (2008) reported a negative significant effect in the Western context for the pooled result. However, Venkatesh and Bals's study did not categorise their finding on either the voluntary or mandatory settings. Nevertheless, Al-Gahtani (2016) study in the Saudi context did not investigate this relationship. The study of the Noor system did examine this relationship in the mandatory setting, and reported that Voluntariness and Experience have no significant moderating effect on the relationship between Subjective Norm and Behavioural Intention, which both offer an equally good contribution within the non-Western context. In terms of nationalities; as Experience using the Noor system increases, the effect size for non-Saudi teachers is

strengthened, while that for non-Saudi teachers is weakened. This once again makes a notable contribution to the literature that would require future investigation.

15. The effect of Voluntariness on the relationship between Subjective Norm and Behavioural Intention was investigated in a voluntary setting H5e. The Noor study found Voluntariness had a weaker significant moderating effect under voluntary setting. Nevertheless, Al-Gahtani (2016) did test this relationship and reported a significantly positive moderating effect. Venkatesh and Bala (2008) study did provide the insignificant *Beta* estimates in the Western context; however, they generalised that the role of moderation within a voluntary setting was much stronger than within a mandatory setting. This shows a huge gap because Venkatesh and Bals's study did not report specific beta values based on mandatory and voluntary setting, but they generalised their findings based on the pooled results. Furthermore, having used Parents and the Students samples to analyse this relationship, it became apparent that Voluntariness had a weaker significant moderating effect on the relationship between Subjective Norm and Behavioural Intention, and not a positive effect as was reported by Al-Gahtani (2016), who used a smaller sample size. Therefore, the Noor system study, thus contributes to the TAM 3 literature by stating that Voluntariness provides a weaker correlation between Subjective Norm and Behavioural Intention within the non-Western context.

16. A three-way moderation interaction was investigated using Voluntariness and Experience H5f as moderating variables under the voluntary settings, with Parents and the Students as the main sample groups. This afforded a unique contribution to the TAM 3 literature, because the studies completed by Venkatesh and Bala (2008) and Al-Gahtani (2016) investigated this interaction relative to Subjective Norm and Behavioural Intention, but they both failed to specify their findings based on system settings. Nevertheless, they both generalised their findings by stating that Experience and Voluntariness have a significant

moderating effect. In contrast, the Noor system study evaluated this relationship and contributes fully to the TAM 3 literature by stating that the interaction between Experience and Voluntariness relative to Subjective Norm and Behavioural Intention has a positive significant moderating effect in a non-Western context. Further contributions were noted regarding nationalities that demand future investigation. It was found that as Experience using the Noor system increases among Saudi students, the effect size of Voluntariness and Subjective Norm on Behavioural Intention is strengthened. Despite this finding, some contrary findings were reported concerning non-Saudi students, and Saudi parents, such that as Experience using the Noor system increases, the effect size became weaker.

17. The influence of Subjective Norm on Perceived Usefulness H6 had the most significant influence on the Noor system study, which correlates with Al-Gahtani (2016) findings. Contributing to the TAM 3 literature, the Noor system study shows the effect of Subjective Norm on Perceived Usefulness within the non-Western context, is significantly higher when compared to the value reported by Al-Gahtani (2016) in the context of the KSA. This is largely due to the differences in the sample size between the two studies. Regarding nationalities, in the mandatory setting, Saudi teachers were found to have a higher effect size relative to non-Saudi Teachers. Likewise, within the voluntary setting, the Saudi students and parents experienced higher effect sizes than their non-Saudis counterparts. This contribution further confirms that the influence of Subjective Norm on Perceived Usefulness is stronger among Saudis than non-Saudis, in both mandatory and voluntary settings.

18. The effect of Subjective Norm and Experience on Perceived Usefulness H6a was important to investigate. Overall, the Noor system reported a weak, but not negative, significant moderation effect within a voluntary setting, that is a non-Western context, in reference to studies by Venkatesh and Bala (2008) within the Western context. In the Saudi context, Al-Gahtani (2016) observed significant negative moderation

effects. The findings of the Noor system study offer a worthwhile contribution to the TAM 3 literature within a non-Western context, contradicting Al-Gahtani (2016), which only used one sample to generalise its finding. However, with regard to nationalities, both Saudi and non-Saudi parents and students exhibited negative correlation trends as Experience using the Noor system increased. These findings thus contribute to the TAM 3 literature, confirming that irrespective of nationalities when using the Noor system, as Experience using the system increases over time, the effect of Subjective Norm on Perceived Usefulness attenuates.

19. The overall findings in relation to the Noor system study showed the influence of Subjective Norm on Image H7. Revealing the strongest and most significant influence in the voluntary setting when comparing studies conducted by Venkatesh and Bala (2008) in the Western context, and Al-Gahtani (2016) in the Saudi context. Nevertheless, a notable contribution was found among the nationalities; that is, the influence of Subjective Norm on Image proved very strong among the Saudis compared with the Western context and non-Saudis from the Middle East. This shows Image is strongly influenced by Subjective Norm, because of the rigidity of the Saudi cultural background.

20. The influence of Image on Perceived Usefulness H8 was reported to have the strongest significant influence within the voluntary context. Regarding nationalities, the Noor system study contributes to the TAM 3 literature, concluding that Image plays a major role in terms of Perceived Usefulness of the Noor system among Saudis, when compared with non-Saudis in a voluntary setting.

21. Job Relevance is critical, as it can create a more positive perception of the usefulness of a system. The influence of Job Relevance on Perceived Usefulness H9 was found to have the strongest significant influence within a voluntary setting. In addition, the findings with nationality as a variable reported that Saudi parents had a greater effect size than non-

Saudi parents. This contributes to the TAM 3 literature that suggests the influence of Job Relevance on Perceived Usefulness is stronger among Saudis than non-Saudis in a non-Western context. A further significant contribution warranting future investigation was also identified. It was anticipated that teachers in a mandatory setting would show the highest effect size, although this was not the case with the Noor system study. This demands further investigation in the future.

22. A two-way moderation interaction involving Output Quality was investigated to ascertain the relationship between Job Relevance and Perceived Usefulness H9a. Studies performed by Venkatesh and Bala (2008) within the Western context, and Al-Gahtani (2016) in a Saudi context resulted in significant moderating effects. The Noor system study did not report any significant moderation effect on the three groups investigated. However, for the nationalities the majority of the effect size was significant, although the effects were negligible. Thus, based on the significance of using a large sample size with three groups, it can be stated that the Noor system study contributed to the TAM 3 literature, proving that in a non-Western context, Output Quality does not have any significant moderating role on the effects of Job Relevance on Perceived Usefulness.

23. The influence of Results Demonstrability on Perceived Usefulness H10 seemingly had the strongest positive significant influence in the mandatory setting. Nevertheless, the overall Noor model reported a negative *Beta* estimate. Venkatesh and Bala (2008), who collected data within the Western context, reported a positive significant effect. Meanwhile, Al-Gahtani (2016) did not report any significant effect in the Saudi context. A notable contribution was found in the Noor system study, where all four models investigated reported significant effects depending on context. Therefore, the Noor system study contributes to the TAM 3 literature, by discovering that in a non-Western context the influence of Results Demonstrability on Perceived Usefulness has a strong positive significant influence within a mandatory setting, while in

a voluntary setting, the effect has a weak significance. With regard to nationalities, Saudis were found to have much greater effect sizes than non-Saudis, which can be translated to mean that Saudis care much more about the influence of the Result Demonstrability of the Noor system on Perceived Usefulness than non-Saudis.

24. The influence of Computer Self-Efficacy on Perceived Ease of Use H11 showed the strongest significant influence within the voluntary setting. Although the effect size was less in the non-Western context, as reported by the Noor system study, and Al-Gahtani (2016), it was also deemed worthwhile to investigate the relationship using nationalities. Al-Gahtani (2016) sample only investigated the Saudi environment. A significant contribution to the TAM 3 literature shows the effect of Computer Self-Efficacy on Perceived Ease of Use is much higher among Saudi participants than non-Saudis among the three groups in the Noor study. This suggests, the more that Saudis believe in their Computer Self-Efficacy, the more likely that they would perceive the Noor system to be easier to use.

25. The influence of Perceptions of External Control on Perceived Ease of Use H12 showed the strongest significant influence under the mandatory setting. Al-Gahtani (2016) reported a much more significant effect within the Saudi context, when compared to the effect reported by Venkatesh and Bala (2008) in the Western context. Therefore, the Noor system study, confirms the effect of Perceptions of External Control on Perceived Ease of Use under the non-Western context is much higher than in the Western context, and that the Noor findings contribute to the TAM 3 literature, showing the effect is much higher compared to that reported in Al-Gahtani (2016) study. Regarding nationalities; the effect of Perceptions of External Control on Perceived Ease of Use proved significantly stronger among Saudis than non-Saudis. This is most likely due to the resources, and support structure afforded by the Saudi government to boost the education sector.

26. The influence of Perceived Enjoyment on Perceived Ease of Use H15 showed the most notable influence within the voluntary setting. Venkatesh and Bala (2008) investigated this relationship in the Western context, although they did not report any significant effect from it. Al-Gahtani (2016) did investigate this relationship under the Saudi context but did not base his finding on the nationalities for the persons who participated in his study. Therefore, the study on the Noor system identified a gap and highlighted the contribution of the TAM 3 literature and the effect of Perceived Enjoyment on Perceived Ease of Use, showing a strong and significant influence in a voluntary setting in the non-Western context. Similarly, when investigating nationalities under the Noor study system, the effect of Perceived Enjoyment on Perceived Ease of Use was found to be much higher among Saudis than non-Saudis in all three groups investigated. Experience using the Noor system was informed by a two-way interactions, designed to investigate the effect of Perceived Enjoyment on Perceived Ease of Use H15a. The Noor model found Experience using the Noor system to have a significant negative moderating effect on the parents model. Al-Gahtani (2016) reported a positive significant effect that contradicted the findings reported by the parents sample. This represents a major contribution in the TAM 3 literature, because the parents sample for the Noor system, used a large sample size, reported that Experience using the Noor system has a significant weaker moderating effect on the relationship between Perceived Enjoyment and Perceived Ease of Use. In addition, when investigating nationalities; the effect on the non-Saudi teachers, parents, students, and Saudi students, and parents confirmed that, as Experience using Noor system increases, the influence of Perceived Enjoyment on Perceived Ease of Use lessens.

9.3. Contributions Based on the Proposed Socio-Demographic Variables and Subjective Norm

Previous studies using the ‘full’ TAM 3, completed by Venkatesh and Bala (2008); Al-Gahtani (2016), only concentrated on Experience, Voluntariness and Output Quality as the chief moderators. However, it is widely known that socio-demographic variables play a significant role in describing the characteristics of investigated samples. It is necessary to affirm here that no special criteria informed the choice of the Socio-demographics described in this section. They were chosen because they showed significant values in their Chi-Square tests and Cross-Tabulations results. This fact warranted further examination using the univariate analysis. Therefore, the Noor system was not limited to socio-demographics with some influence on the relationships outlined in the TAM 3. Nevertheless, due to the strong cultural background in the KSA, it was considered appropriate to investigate the role the chosen socio-demographic variables would have on the Subjective Norm. Likewise, consideration of nationalities in the three groups in the Noor system study was made. Notable findings were observed, which can then be investigated further in the future to test their viability as tools to be incorporated as additional moderators in the TAM 3, while studying the Noor system in the KSA, or when studying similar educational systems in the Middle East among. The contribution of the socio-demographics follows:

1. The effect of age on the relationship between Subjective Norm and Behavioural Intention showed that only the non-Saudi teachers had a strong positive trend in terms of effect size which indicated that, as age increases, the effect of Subjective Norm on Behavioural Intention to use the Noor system grows. Nevertheless, the effect size trend on non-Saudi parents, non-Saudi students, Saudi teachers, and Saudi parents weakened in relation to increase in age.

2. Gender was reported to have the strongest significant effect within the mandatory setting among non-Saudi female teachers, when compared to

the non-Saudi female teachers relationship between Subjective Norm and Behavioural Intention.

3. Regarding help and support, the effect within the mandatory setting on the relationship between Subjective Norm and Behavioural Intention, was much stronger among Saudis than non-Saudis using the Noor system.

4. The current use of the Noor system, i.e. help and support under the voluntary setting, was reported to significantly influence the impact of the Subjective Norm on Behavioural Intention to use the Noor system.

5. A lack of Internet access at home was reported to have a significant effect under the mandatory setting among Saudi teachers, in terms of the effect of Subjective Norm on Behavioural Intention to use the Noor system.

6. The effect of Internet experience on the relationship between Subjective Norm and Behavioural Intention was reported to become weaker with an increase in Internet experience, especially among Saudi teachers.

7. The effect of an increase in Internet proficiency was reported to become significantly stronger, especially among non-Saudi students when debating the relationship between Subjective Norm and Behavioural Intention. Therefore, the effect of Subjective Norm on Behavioural Intention grew with improved Internet proficiency among non-Saudi students.

8. The average time spent using the Internet showed the effect of Subjective Norm on Behavioural Intention becomes significantly weaker with an increase in average time dedicated to using the Internet, specifically among non-Saudi teachers, non-Saudi students, non-Saudi parents, Saudi students, and Saudi parents. Regarding Saudi teachers, as the average time for internet use increases, the effect of Subjective Norm on Behavioural Intention becomes significantly stronger.

9. Regarding educational level, the effect of Subjective Norm on Behavioural Intention among non-Saudi teachers was reported to increase significantly with any increase in the educational level under the mandatory setting. As for Saudi teachers and non-Saudi parents', the effect becomes weaker as educational level increases.

10. The effect of Subjective Norm on Behavioural Intention was found to increase strongly with monthly income among non-Saudi teachers within a mandatory setting, and the non-Saudi parents in a voluntary setting. Regarding Saudi teachers, and Saudi parents, the effect of Subjective Norm on Behavioural Intention to use the Noor system grows weaker with rise in monthly income.

11. Lack of Internet access at work in the mandatory setting was found to be significantly influenced by the effect of Subjective Norm on Behavioural Intention to use the Noor system, with the effect being much greater among non-Saudi teachers than their Saudi counterparts.

12. Attending Noor system training within the mandatory setting, was found to have the highest effect on the relationship between Subjective Norm and Behavioural Intention among the non-Saudi teachers. Moreover, in the context of the voluntary setting, the effect was much stronger among Saudis than non-Saudis; however, the Saudis acknowledged having attended Noor system trainings.

13. When discussing private Noor system training, it was found that within the voluntary setting, attendance had a significant influence on the effect of Subjective Norm on Behavioural Intention to use the Noor system. This effect was much higher among non-Saudi students than their Saudi counterparts.

14. Regarding interaction among groups Nationality, Gender, and Educational Levels and the relationship between Subjective Norm and Experience on Behavioural Intention, a significant moderate effect was

found among female non-Saudi teachers, holding a bachelor's degree. Regarding parents, the effect was moderate among male non-Saudi parents with an intermediate level of education.

15. Interactions between groups, Nationality, Gender, and Educational Level were used to investigate the effect of Subjective Norm, Experience and Voluntariness on Behavioural Intention to use the Noor system. The effect was found to be very strong among male Saudi parents with a primary level of education.

16. The interaction between groups, Nationality, Gender, and Experience using the Noor system was similarly used to investigate the effect of Subjective Norm, Experience, and Voluntariness on Behavioural Intention. The effect was reported to be moderate among male Saudi teachers with six-12 months Experience using the Noor system.

9.4. Contributions Based on the Importance of Retaining Use Behaviour as the main Dependent Variable in the Technology Acceptance Model 3 Under the Self-reported Usage

The following are the contributions derived in the current study concerning the deletion and retention of the Use Behaviour construct in the TAM 3;

1. The factor loadings for Behavioural Intention will increase, but the factor loadings for the other determinants will not change. When the factor loadings increase, the construct reliability and Average Variance Extracted will also increase, which might in turn not reflect genuine convergent and divergent validity tests.

2. The relative fit indices on the model increases, which might prove problematic during the interpretation of the model fit, potentially resulting in the rejection of a better fit model.

3. The *beta* estimates will either increase or decrease, depending on the system setting usage. When the *beta* estimate decreases, this will lead to an interpretation of the hypotheses as not having a good impact on the hypotheses being investigated.

4. The explained variance for Behavioural Intention will decline, although that for Perceived Ease of Use and Perceived Usefulness will remain constant under mandatory and voluntary settings. When the explained variance decreases, Behavioural Intention might not be considered a good predictor of the TAM 3.

9.5. Contributions based on system setting

The summative Table 11.68 in Appendix K, shows the voluntary settings had the strongest effect on relationships when postulated in the TAM 3 regarding the Noor system in the KSA. The voluntary setting represented 71% of influence, while the mandatory setting represented 29% of the hypothesised TAM 3 relationships. This shows the use of the Noor system is highly dependent on the system being set as voluntary. Therefore, this finding adds value by contributing new data to augment the literature on the TAM 3, which shows people are more likely to use an information system when it is voluntary than when it is mandatory. This concept can also be tested in western cultures to determine if the fact can hold ground.

9.6. Conclusion

This Chapter describes the contributions identified in the study. Several contributions are discussed in relation to the hypotheses outlined in Chapter 3. Moreover, these findings have been shown to contribute to the literature on the TAM 3. The summarised contributions were reviewed by comparing the findings between Saudis, and the non-Saudis from the Middle East.

Similarly, the contribution of Socio-demographics on Subjective Norm is described. These Socio-demographics are unrelated to the TAM 3 moderators, but were tested to establish the possibility of incorporating them in the TAM 3. Therefore, in terms of a future recommendation, it is suggested that socio-demographics are deemed significant and fully investigated using the TAM 3, with the possibility of incorporating them as moderators of the TAM 3, regarding the use of the Noor system.

It has become apparent in this study that the TAM 3 is not only limited to Experience, Voluntariness, and Output Quality as moderators. Socio-demographic variables offer a wealth information worth exploring, especially regarding cultural influence. This study was conducted in a non-Western context. It was not wise to categorically state that the study of the Noor system pertained solely to the Saudi context, because the data set included information relating to Saudi and non-Saudi individuals. This explains the appropriacy of categorising the Noor study conducted in a non-Western context. Future investigations would be valuable, especially in a Western context, to review similar management and education information systems in the Western world.

Finally, the next chapter will outline a summative overview of the study. Emphasis will be placed on reviewing the main findings of the study. Moreover, all five objectives stated in chapter one will be concluded. Likewise, the design of the questionnaires will be re-visited again briefly, and the limitations of the study will be discussed, and future recommendations presented.

10 CHAPTER TEN: CONCLUSIONS

10.1. Introduction

This final chapter presents the conclusions based on the main findings of this study; specifically, it discusses the aims and objectives of the research in relation to the applicability and suitability of the Noor system in the KSA. Moreover, it considers the appropriateness of using the TAM 3 in the Noor system study, the questionnaire design, and the limitations of the study, as well as making recommendations, and suggestions for subsequent research in this area.

10.2. Main Findings

The study investigated the applicability of the Noor system in the KSA using the TAM 3. Several hypotheses supported by the literature reviews were explored. The principal findings were compared with those from the studies that had adopted the 'full' TAM 3. Likewise, the role played by the TAM 3 moderators was also explored. The effect of socio-demographic variables on the hypothetical relationships involved in the TAM 3 was explored in relation to the nationalities found in the KSA. Furthermore, it was worth exploring differences among the Saudis and the non-Saudis regarding their responses to the TAM 3 regarding using the Noor system. Arabic is the main teaching language in schools across all the regions in the KSA. In addition, the majority of the nationals from the Middle East enrol in Schools in the KSA, because they understand Arabic. These findings are summarized according to the objectives stated in Chapter one.

10.2.1. Testing the Appropriateness of Noor System in the Kingdom of Saudi Arabia Using the Technology Acceptance Model 3

A TAM 3 can only be deemed complete when it encompasses all five main constructs; i.e. Perceived Ease of Use, Perceived Usefulness, Image, Behavioural Intention, and Use Behaviour. The majority of the studies that were reviewed in Chapter two had evaluated the original Technology Acceptance Model, or The Technology Acceptance Model 2. Nevertheless, two studies, one by Al-Gahtani (2016) in the Saudi context, and Venkatesh and Bala (2008) in the Western context, met the criterion of adoption of the full TAM 3 though Al-Gahtani did not measure Use Behaviour. Therefore, the study on the Noor system investigated all five main constructs and contributed to the TAM 3 literature by investigating Use Behaviour in a non-Western context. In general, the Noor system study was found to be a better predictor of variance explained in terms of Perceived Ease of Use and Perceived Usefulness, when compared to Venkatesh and Bala (2008) and Al-Gahtani (2016), who had reported the least explained variances. Therefore, the study concludes that it was, and still is, appropriate to study the Noor system in the KSA using the TAM 3.

10.2.2. Comparing the Applicability of the Technology Acceptance Model 3 on the Noor System Among the Organisational Users (Mandatory) and Public/Non-Organisational Users (Voluntary) In the Kingdom of Saudi Arabia

The study on the Noor system investigated 19 hypotheses by exploring significant effects under both a mandatory and voluntary setting. The mandatory setting was represented by teachers', while the voluntary setting was represented by both students' and parents'. Several good contributions regarding the applicability of the TAM 3 were discussed in Chapter 8. Besides, very good contributions comparing the Saudis and the non-Saudis from the Middle East have been discussed. However, the influence of Computer Anxiety on Perceived Ease of Use H13, and Computer Anxiety X Experience on Perceived Ease of Use on Perceived Ease of Use H13a made no significant contribution in the Noor study. This was because Computer Anxiety was no longer perceived as a strong factor to influence the ease with which both Saudis and non-Saudis would perceive the Noor system as easier to use. In some instances, the effect on the relationships hypothesised was strong within a mandatory setting, but in some instances, the effects were stronger in a voluntary setting. Therefore, the study concludes that not only is the TAM 3 applicable in the KSA when studying the

Noor system under mandatory and voluntary conditions, but it is likewise applicable for non-Saudis. This means the Noor system could be refined using the findings from the current study, for adoption in other Middle Eastern countries that speak Arabic.

10.2.3. Exploring the Role that the Demographics Moderators Can Play on the Acceptance of the Noor System by Testing the Technology Acceptance Model 3

The TAM 3 has three main moderators; i.e. Experience, Voluntariness, and Output Quality. Typically, Socio-demographic variables offer useful information that cannot be readily ignored. Furthermore, socio-demographic variables play a major role in the early stages of an analysis. Preliminary analysis using cross-tabulations can be used to eliminate demographics that have no significant findings. Some demographic variables were shared among the three groups, while others were restricted to teachers and parents alone, and others were restricted to individual groups. The majority of the socio-demographic variables were found to offer very important information as outlined in Chapter 8. Therefore, it was suggested that TAM 3 should not only be limited to traditional moderators, but should also explore the possibility of testing and incorporating other socio-demographics as additional moderators. However, this will depend entirely on the context of the study under investigation.

10.2.4. Investigating the Influence that Saudi Culture has on the Behavioural Intention and Perceived Usefulness to Use the Noor system

The KSA is well known for its strong cultural heritage. Saudi culture was investigated via the variables, Subjective Norms and Behavioural Intention, and the Perceived Usefulness of the Noor system. This investigation was made possible by comparing Venkatesh and Bala (2008); Al-Gahtani (2016). The findings from the Noor system study, and Al-Gahtani (2016) research confirmed that the influence of Subjective Norm on Behavioural Intention proved stronger within a non-Western context. However, the sample for the Noor system study included multiple nationalities, not just Saudis. Therefore, it was considered appropriate to investigate this relationship by comparing findings between Saudis andnon-Saudis. Upon grouping, investigating, and comparing the teachers, the students, and the parent sample according to their nationalities, the effect of Subjective Norm on Behavioural Intention was found to be much stronger among Saudis than non-Saudis. This suggests that a strong Saudi cultural background has a strong effect on Behavioural Intention to use the Noor system, when compared with data from non-Saudis in other Middle Eastern countries.

The Noor system study reported the strongest influence from Subjective Norm on Perceived Usefulness relative to Al-Gahtani (2016), who investigated only Saudis. When comparing nationalities under the Noor system study, Saudi teachers were found to have a more marked effect than non-Saudi teachers. Moreover, Saudi students and parents reported greater effects than their non-Saudi counterparts. These findings concluded that the influence of Subjective Norm on Perceived Usefulness was stronger among Saudis compared than non-Saudis, both in mandatory and voluntary settings.

10.2.5. Investigating the Effect of Retention or Deletion of Use Behaviour as the Main Dependent Variable in the Technology Acceptance Model 3 Under a Self-Reported System Usage

Based on the current study, it is recommended that when an information system is already in use, it becomes very important to measure Use Behaviour in the TAM 3. These were proved by investigating the *beta* estimate values, the factor loadings, and variance explained in terms of Perceived Ease of Use, Perceived Usefulness, and Behavioural Intention. Wu and Du (2012) stated that most behavioural studies do not measure usage but merely individuals' intention. Therefore, Use Behaviour needs to be incorporated as the main dependent variable in the TAM 3, especially when measuring it using a self-reported method.

10.3. Questionnaire Design

The Noor study was extensive, such that it investigated three groups of participants. Therefore, the TAM 3 items were similar across the three groups. Regardless, some demographic questions were shared between the groups, while others varied. The teachers and parents shared the majority of the demographics, while the demographics for the students varied. For example, the students were not supposed to respond to questions about the number of children they had, the use of the Noor system for monitoring the academic progress of their children, or internet access at work etc. Likewise, the teachers were asked additional questions regarding their teaching levels, weekly teaching lessons, student numbers etc. The students also had extra questions regarding their class level, and their major. In addition, the questionnaire was designed in such a way that the respondents could not proceed to answer follow-up questions, without first responding to the overarching question.

10.4. Limitations of the Study

Studies pose their own unique challenges, and the Noor system study is no exception to this rule. The following limitations were encountered during the Noor system study:

1. Objective Usability is one of the main determinants of the TAM 3. In this study, Objective Usability was found to have a factor loading above 0.60. However, its items were removed from the final model. This was because Objective Usability could only be measurable by performing a practical experiment addressing the actual usability of the Noor system for teachers, students, and parents. Thus, Objective Usability was completely removed from the final Noor system study.

2. Computer Playfulness had four main items in the initial full model comprising the teachers, the students, and the parents. However, two of the items failed the factor loading test, and were thus removed from the model. After removing the two items, a problem was encountered, such

that one of the remaining items was found to have a negative error variance rendering the SEM solution inadmissible, and thus no SEM results were generated. This led to the deletion of the entire determinant of Computer Playfulness, and so the final model adopted for the Noor system study did not measure this component.

3. In the Noor system study, nationality was categorised into two groups, Saudis and non-Saudis (although some of the participants Asians, Africans, Indian, Europeans, Americans, etc. residing in the KSA with an excellent command of the Arabic language).The participants were not asked to declare their actual nationality, which obscures the data; thus, had the questionnaire requested specific nationalities, it would have contributed extra value to the current study, and would have generated more informative conclusions regarding the Western and non-Western contexts.

4. The response rate for the pilot study was 3.4%. The pilot study was conducted using online questionnaires. This proved very useful, as it gave the guidelines on the Noor study in terms of response rate, the initial reliability of the formulated questions, and the validity of the questions. Furthermore, the pilot study helped to anticipate the approximate time for completion of the questionnaire. The pilot study highlighted some limitations; in particular the majority of the respondents complained that the questions were too long. In response, some were deleted and others paraphrased and shortened for clarity. Despite this, the online questionnaires were still very lengthy, because they needed to collect demographic variables and data regarding TAM 3 items for each construct and determinants.

5. The principal investigator in this study had no control concerning the regions of the KSA that would be actively participating. This was because the Noor system is a government owned database, and the officials only follow directives from senior officers. Therefore, in the

current study, there was no choice in terms of the region in which the Noor study would be conducted.

6. The other limitation was that some participants had been registered as Noor system users with their national identification numbers. This means they had no email address, so their participation cannot be verified.

10.5. Recommendations, and Suggestions on Further Research

Based on the findings and the contributions of this study, further research would be appropriate to fulfil the following aims:

1. Regarding nationalities, future studies of the Noor system need to focus on the specific nationalities found in the KSA. The beneficial information that would be generated by such studies, would then effectively assist in the adoption and applicability of the Noor system, not only in the KSA, but also in other counties in the Middle East, where Arabic is the main teaching language in public schools.

2. The Subjective Norm (Saudi culture) was found to have a strong effect on Behavioural Intention, and Perceived Usefulness in KSA, when compared with the non-Saudi contexts. Nevertheless, in some hypotheses, the findings suggested a stronger effect among non-Saudis. Therefore, future TAM 3 studies from the KSA, should engage in further investigation to unveil the causes of the differences between the different nationals in the KSA who share the same educational system developed using Arabic.

10.6. Concluding Remarks

In summary, the Noor system included five main objectives, which were fully investigated. Several contributions were found and reported. The results of the Noor system study were found to be valid and suitable for generalisation. Unlike the study conducted by Al-Gahtani (2016), the Noor system study investigated three sample groups all of which had sufficient sample sizes. Therefore, there were no limits placed upon the generalisability of the results, when referring to the adult and student populations that use the Noor system. This study contributed to the TAM 3 literature regarding the non-Western context, both under mandatory and voluntary settings, and the literature on information systems in general. It is crucial to measure system usage on the existing information system. Failing to measure Use Behaviour, has some implications in terms of the relative fit indices of the model, factor loadings, *beta* estimated values, and explained variance on Behavioural Intention. Moreover, it is anticipated that this study will have some impact beyond the borders of the KSA, where similar educational IT systems are already in place; although they are not as comprehensive as the Noor system. The findings and recommendations of this study should therefore lay the groundwork for concrete measures and implementation by the government of KSA, to ensure that the Noor system is a successful endeavour for all the countries involved. The summary of the literature citations as used in the Noor study is found on Table 11.72 on Appendix N.

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11Appendices

Appendix A

Table 11.1: Overall comparative analysis based on the pooled data inclusive of moderation interactions, and one time cross-sectional events (T1).

	Noor System	Venkatesh and Bala (2008)	Venkatesh and Bala (2008)	Al-Gahtani (2016)	Teachers	Parents	Students
Hypotheses	*B(pooled)*	*B (pooled)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*
H1: USE <---BI	0.608***	0.59***	0.57***	Nil	0.511***	0.586***	0.661***
H2: BI <---PU	0.212***	0.56***	0.55***	0.37***	0.333***	0.178***	0.185***
H3: BI <---PEOU	0.306***	0.04	0.24***	0.25***	0.287***	0.275***	0.368***
H3a: BI <---PEOU X EXP	0.054***	(-0.24***)	_	0.01**	(-0.099***)	0.053*	0.089 ***
H4: PU <---PEOU	0.418***	0.08	0.22***	0.21**	0.643***	0.397***	0.325***
H4a: PU <---PEOU X EXP	(-0.017)	0.39***	_	0.08*	-0.019	(-0.035**)	(-0.053**)
H5: BI <---SN	0.338***	0.02	0.03	0.35***	0.243***	0.340***	0.373***
H5a: BI <---SN X EXP	(-0.071***)	0.04	_	(-0.1**)	0.074**	(-0.092) ***	(-0.091***)
H5b: BI <---SN X VOL	(-0.173***)	0.07	0.29***	Nil			
H5c: BI <---SN X VOL	Nil	0.03		Nil	(-0.099**) c		
H5d:BI <---SN X VOL X EXP	Nil	(-0.46***)	_	Nil	(-0.015) d		
H5e:BI <---SN X VOL	Nil	0.03		0.14**		(-0.134***) e	(-0.188***) e
	Nil						
H5f:BI <---SN X VOL X EXP	Nil	(-0.46***)		Nil		(0.042*) f	(0.034) f

	Noor System	Venkatesh and Bala (2008)	Venkatesh and Bala (2008)	Al-Gahtani (2016)	Teachers	Parents	Students
Hypotheses	*B(pooled)* Nil	*B (pooled)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*
H6: PU <---SN	0.239***	0.04	0.40***	0.15**	0.288***	0.187***	0.274***
H6a: PU <---SN X EXP	0.079***	(-0.29***)	_	(-0.05*)	0.046	0.086***	0.097***
H7: IMG <---SN	0.669***	0.24***		0.44***	0.619***	0.682***	0.666***
H8: PU <---IMG	0.1***	0.24***	0.27***	0.13**	0.089***	0.058***	0.125***
H9: PU <---REL	0.512***	0.03	0.04	0.38***	0.292***	0.568***	0.538***
H9a: PU <---REL X OUT	0.002	0.35***	0.37***	0.15**	0.003	-0.026	0.009
H10: PU <---RES	(-0.05***)	0.26***	0.22***	0.02	0.061*	(-0.07***)	(-0.038*)
H11: PEOU <---CSE	0.081***	0.31***	0.35***	0.18**	0.111***	0.064***	0.115***
H12: PEOU <---PEC	0.721***	0.33***	0.37***	0.45***	0.792***	0.643***	0.733***
H13: PEOU <---CANX	0.061***	(-0.18**)	(-0.22***)	(-0.11**)	0.032*	0.053**	0.084***
H13a: PEOU <---CANX X EXP	0.023	(-0.22***)	_	(-0.03)	0.003	0.029	0.017
H14: PEOU <---CPLAY	NERM	0.15**	0.20**	0.02	NERM	NERM	NERM
H15: PEOU <---ENJ	0.351***	0.04	0.02	0.2**	0.331***	0.463***	0.272***
H15a: PEOU <---ENJ X EXP	(-0.031)	0.18**	_	0.08*	-0.015	(-0.055***)	(-0.036)
H16: PEOU <---OU	NERM	0.03	0.04	Nil	NERM	NERM	NERM

	Noor System	Venkatesh and Bala (2008)	Venkatesh and Bala (2008)	Al-Gahtani (2016)	Teachers	Parents	Students
Hypotheses	*B(pooled)*	*B (pooled)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*	*B (T1)*

Notes: NERM=Not Estimated Removed from the Model PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability, CANX=Computer Anxiety, CPLAY=Computer Playfulness, OU=Objective Usability. a=H5a, b=H5b, c=H5c (Teachers' in mandatory settings), d=H5d (Teachers' in mandatory settings), e=H5e (Parents' and Students' in a voluntary settings), and f=H5f (Parents' and Students' in a voluntary setting). * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix B

Table 11.2: Univariate test of Behavioural Intention on Use Behaviour; tests of Between-Subjects Effects

Dependent Variable: Use Behaviour
Independent variable: Behavioural Intention

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.394
	Saudi	<.001	0.332
Students’	non-Saudis	<.001	0.323
	Saudi	<.001	0.377
Parents’	non-Saudis	<.001	0.382
	Saudi	<.001	0.263

Table 11.3: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Usefulness

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.55
	Saudi	<.001	0.508
Students’	non-Saudis	<.001	0.349
	Saudi	<.001	0.362
Parents’	non-Saudis	<.001	0.398
	Saudi	<.001	0.282

Table 11.4: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent variable: Perceived Ease of Use

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.498
	Saudi	<.001	0.464
Students’	non-Saudis	<.001	0.293
	Saudi	<.001	0.311
Parents’	non-Saudis	<.001	0.356
	Saudi	<.001	0.266

Table 11.5: Univariate test on Perceived Ease of Use X Experience on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Ease of Use * Experience

Experience Using Noor	Nationality	Teachers' *p* value	Teachers' Partial Eta Squared	Students' *p* value	Students' Partial Eta Squared	Parents' *p* value	Parents' Partial Eta Squared
Less than 6 months	non-Saudis	0.002	0.379	<.001	0.427	<.001	0.277
	Saudi	<.001	0.455	<.001	0.298	<.001	0.274
6-12 months	non-Saudis	0.001	0.385	<.001	0.303	<.001	0.286
	Saudi	<.001	0.391	<.001	0.395	<.001	0.242
1-2 years	non-Saudis	<.001	0.256	<.001	0.192	<.001	0.211
	Saudi	<.001	0.552	<.001	0.302	<.001	0.281
2-3 years	non-Saudis	<.001	0.516	<.001	0.336	<.001	0.243
	Saudi	<.001	0.542	<.001	0.257	<.001	0.251
3-4 years	non-Saudis	0.07	0.125	<.001	0.372	<.001	0.199
	Saudi	<.001	0.417	<.001	0.256	<.001	0.258
4 years or more	non-Saudis	<.001	0.312	<.001	0.275	<.001	0.079
	Saudi	<.001	0.394	<.001	0.377	<.001	0.276

Figure 11-1 : Interaction effect between Perceived Ease of Use and Experience using Noor on Behavioural Intention among the Saudis Parents'.

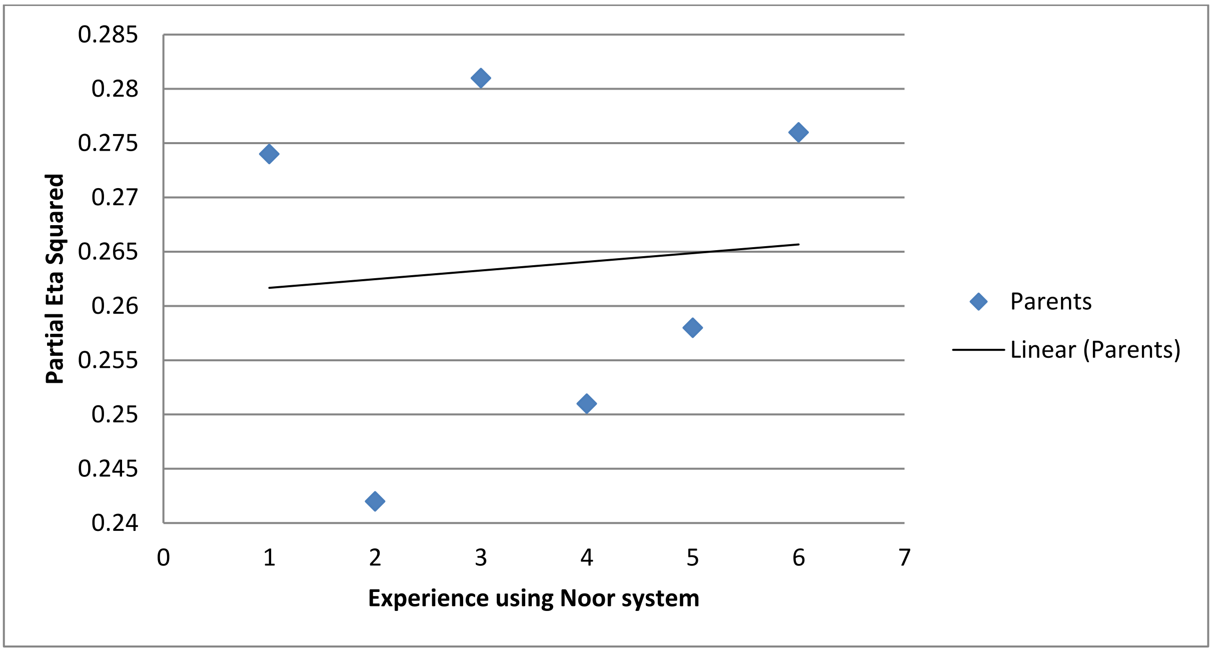

Table 11.6: Univariate test of Perceived Ease of Use * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variables: Perceived Ease of Use * Experience

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	0.891	0
	Saudi	<.001	0.126
Students’	non-Saudis	0.283	0.001
	Saudi	0.383	0
Parents’	non-Saudis	<.001	0.021
	Saudi	0.001	0.003

Table 11.7: Univariate test of Perceived Ease of Use on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness

Independent variable: Perceived Ease of Use

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.696
	Saudi	<.001	0.605
Students’	non-Saudis	<.001	0.334
	Saudi	<.001	0.39
Parents’	non-Saudis	<.001	0.532
	Saudi	<.001	0.471

Table 11.8: Univariate test on Perceived Ease of Use X Experience on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent variable: Perceived Usefulness

Independent variable: Perceived Ease of Use

		Teachers’		Students’		Parents’	
Experience Using Noor	Nationality	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
Less than 6 months	non-Saudis	0.039	0.946	<.001	0.942	<.001	0.837
	Saudi	<.001	0.977	<.001	0.849	<.001	0.8
6-12 months	non-Saudis	<.001	0.972	<.001	0.857	<.001	0.689
	Saudi	<.001	0.998	<.001	0.884	<.001	0.8
1-2 years	non-Saudis	<.001	0.896	<.001	0.784	<.001	0.745
	Saudi	<.001	0.939	<.001	0.857	<.001	0.775
2-3 years	non-Saudis	<.001	0.961	<.001	0.848	<.001	0.72
	Saudi	<.001	0.95	<.001	0.813	<.001	0.697
3-4 years	non-Saudis	0.002	0.988	0.002	0.814	<.001	0.795
	Saudi	<.001	0.947	<.001	0.781	<.001	0.705
4 years or more	non-Saudis	<.001	0.961	<.001	0.892	<.001	0.655
	Saudi	<.001	0.868	<.001	0.777	<.001	0.698

Table 11.9: Univariate test of Perceived Ease of Use * Experience on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness

Independent variable: Perceived Ease of Use * Experience

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	0.562	0.001
	Saudi	<.001	0.195
Students’	non-Saudis	0.068	0.004
	Saudi	0.151	0.001
Parents’	non-Saudis	<.001	0.033
	Saudi	0.001	0.003

Figure 11-2: Interaction effect of Perceived Ease of Use and Experience using Noor on Perceived Usefulness among Saudis Teachers’

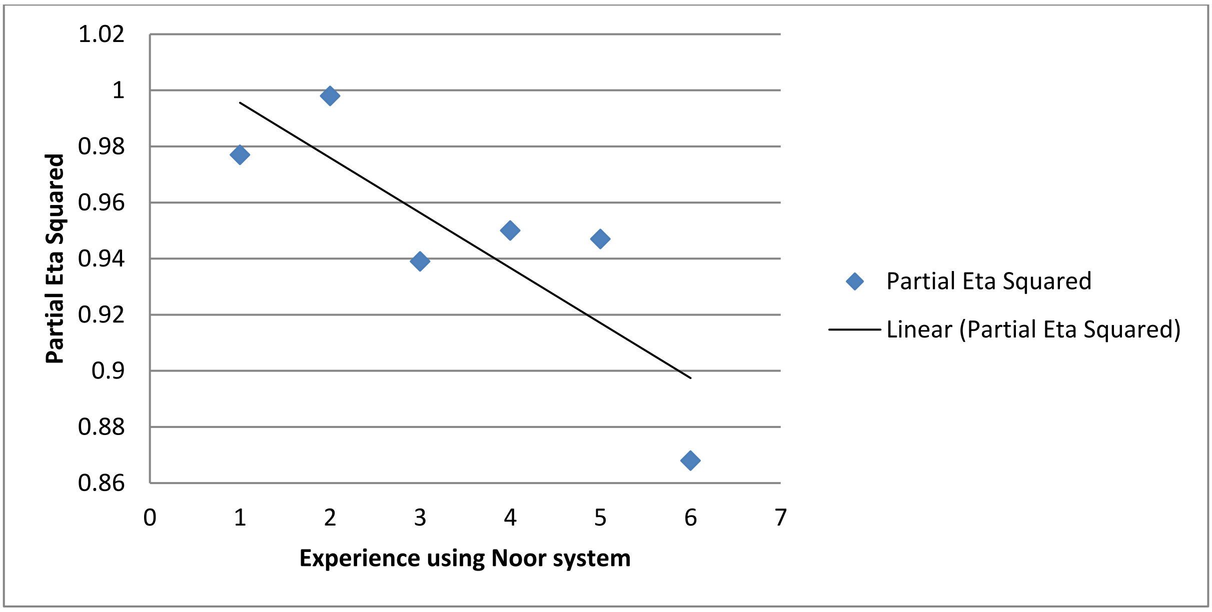

Table 11.10: Univariate test of Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Subject Norm

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.423
	Saudi	<.001	0.425
Students’	non-Saudis	<.001	0.334
	Saudi	<.001	0.36
Parents’	non-Saudis	<.001	0.279
	Saudi	<.001	0.308

Table 11.11: Univariate test of Subject Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Subject Norm * Experience

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	0.159	0.008
	Saudi	<.001	0.116
Students’	non-Saudis	0.256	0.001
	Saudi	0.617	0
Parents’	non-Saudis	<.001	0.029
	Saudi	0.001	0.003

Table 11.12: Univariate test on Subjective Norm and Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Subject Norm

		Teachers’		Students’		Parents’	
Nationality	Experience Using Noor	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
	Less than 6 months	0.039	0.861	<.001	0.883	<.001	0.483
	6-12 months	0.133	0.691	<.001	0.598	<.001	0.502
	1-2 years	0.054	0.527	<.001	0.555	<.001	0.382
non-Saudis	2-3 years	<.001	0.766	<.001	0.615	0.002	0.285
	3-4 years	0.016	0.712	<.001	0.678	0.007	0.363
	4 years or more	<.001	0.723	<.001	0.603	0.011	0.307
	Less than 6 months	<.001	0.899	<.001	0.593	<.001	0.512
	6-12 months	0.017	0.699	<.001	0.68	<.001	0.489
	1-2 years	<.001	0.714	<.001	0.537	<.001	0.465
Saudi	2-3 years	<.001	0.667	<.001	0.526	<.001	0.444
	3-4 years	<.001	0.533	<.001	0.515	<.001	0.525
	4 years or more	<.001	0.517	<.001	0.641	<.001	0.447

Figure 11-3: The effect size of Subjective Norm and Experience on Behavioural Intention on Teachers'.

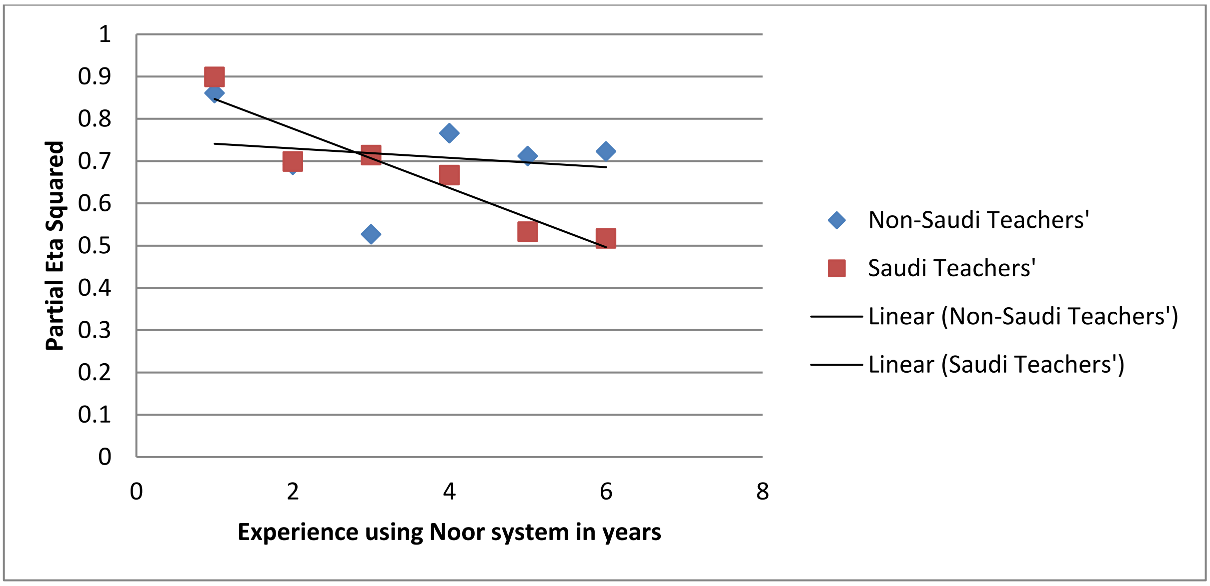

Figure 11-4: The effect size of Subjective Norm and Experience on Behavioural Intention on Students'.

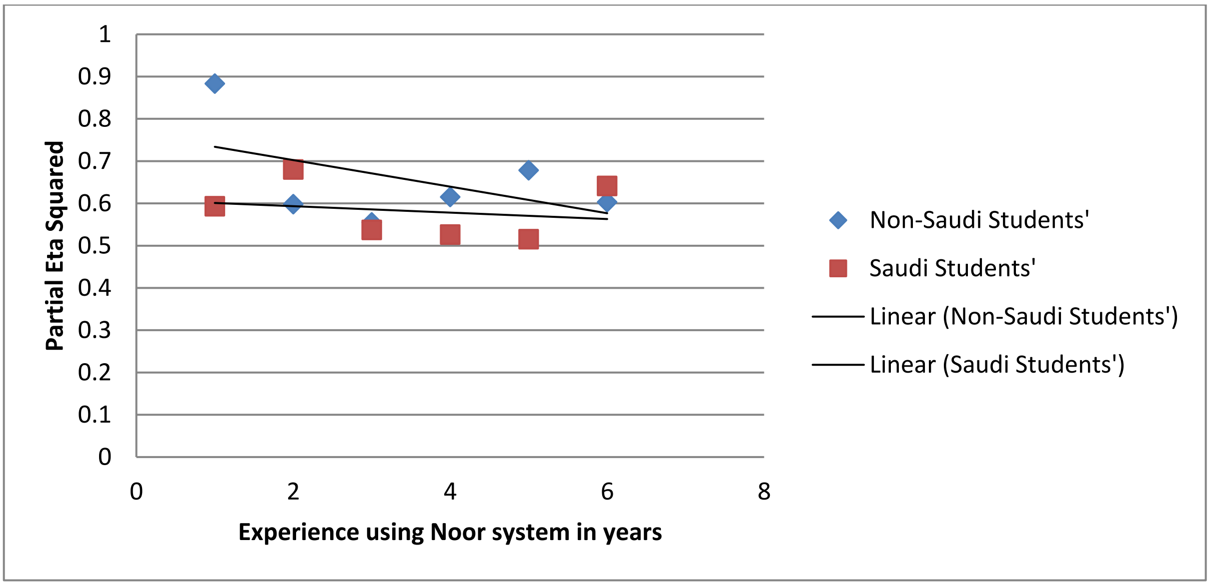

Figure 11-5: The effect size of Subjective Norm and Experience on Behavioural Intention on Parents'.

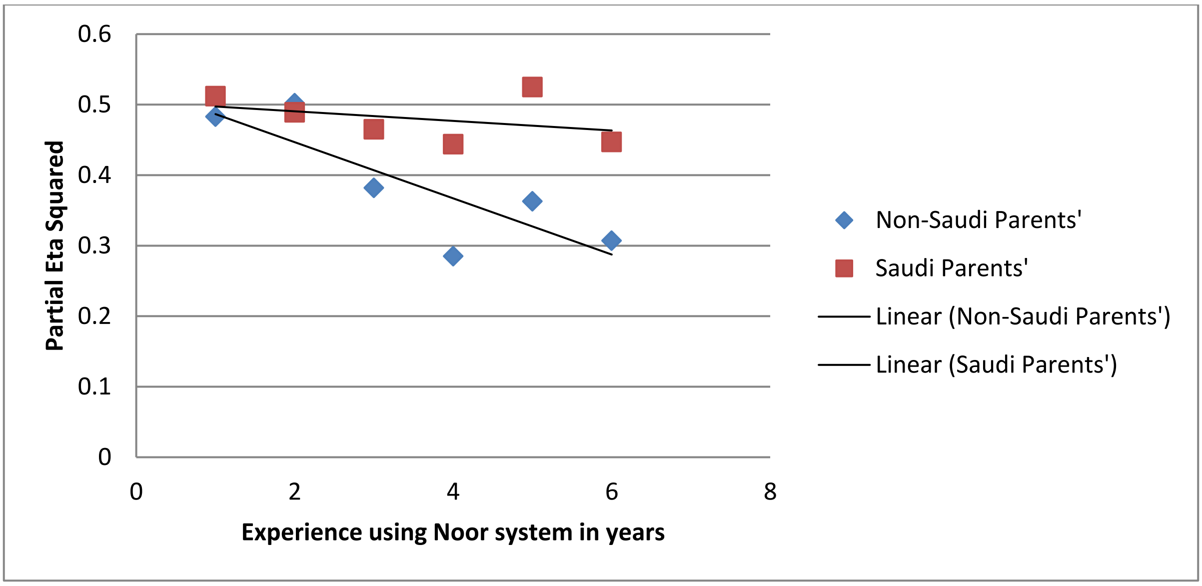

Table 11.13: Univariate test on Voluntariness * Subject Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variables: Voluntariness * Subject Norm

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.094
	Saudi	<.001	0.253
Students'	non-Saudis	0.59	0
	Saudi	<.001	0.015
Parents'	non-Saudis	<.001	0.033
	Saudi	0.049	0.001

Table 11.14: Univariate test on Voluntariness * Subject Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variables: Voluntariness * Subject Norm

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.094
	Saudi	<.001	0.253

Table 11.15: Univariate test on Voluntariness * Subject Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention			
Independent variables: Voluntariness * Subject Norm			
Group	Nationality	*p* value	Partial Eta Squared
Students’	non-Saudis	0.59	0
	Saudi	<.001	0.015
Parents’	non-Saudis	<.001	0.033
	Saudi	0.049	0.001

Table 11.16: Univariate test on Voluntariness * Subject Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention				
Independent variable: Subject Norm * Voluntariness * Experience				
Group	Nationality	Experience Using Noor	*p* value	Partial Eta Squared
Students’	non-Saudis	Less than 6 months	0.722	0.001
		6-12 months	0.022	0.044
		1-2 years	0.858	0
		2-3 years	0.082	0.014
		3-4 years	0.966	0
		4 years or more	0.262	0.009
	Saudi	Less than 6 months	0.019	0.015
		6-12 months	0.26	0.005
		1-2 years	0.865	0
		2-3 years	0.131	0.004
		3-4 years	0.009	0.015
		4 years or more	0.021	0.011
Parents’	non-Saudis	Less than 6 months	0.045	0.017
		6-12 months	0.002	0.051
		1-2 years	0.607	0.001
		2-3 years	0.484	0.002
		3-4 years	0.003	0.046
		4 years or more	0.471	0.002
	Saudi	Less than 6 months	0.005	0.01
		6-12 months	0.017	0.016
		1-2 years	0.005	0.01
		2-3 years	0.903	0
		3-4 years	0.012	0.014
		4 years or more	0.003	0.01

Table 11.17 Univariate test on Voluntariness * Subject Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Subject Norm * Voluntariness * Experience

Group	Nationality	Experience Using Noor	*p* value	Partial Eta Squared
Teachers'	non-Saudis	Less than 6 months	0.1	0.124
		6-12 months	0.392	0.029
		1-2 years	0.686	0.003
		2-3 years	<.001	0.322
		3-4 years	0.068	0.127
		4 years or more	0.043	0.06
	Saudi	Less than 6 months	0.001	0.14
		6-12 months	<.001	0.425
		1-2 years	<.001	0.119
		2-3 years	<.001	0.273
		3-4 years	<.001	0.236
		4 years or more	<.001	0.207

Figure 11-6: The interactive effect of Subjective Norm* Voluntariness* Experience using Noor system on Behavioural Intention among the non-Saudi Teachers'.

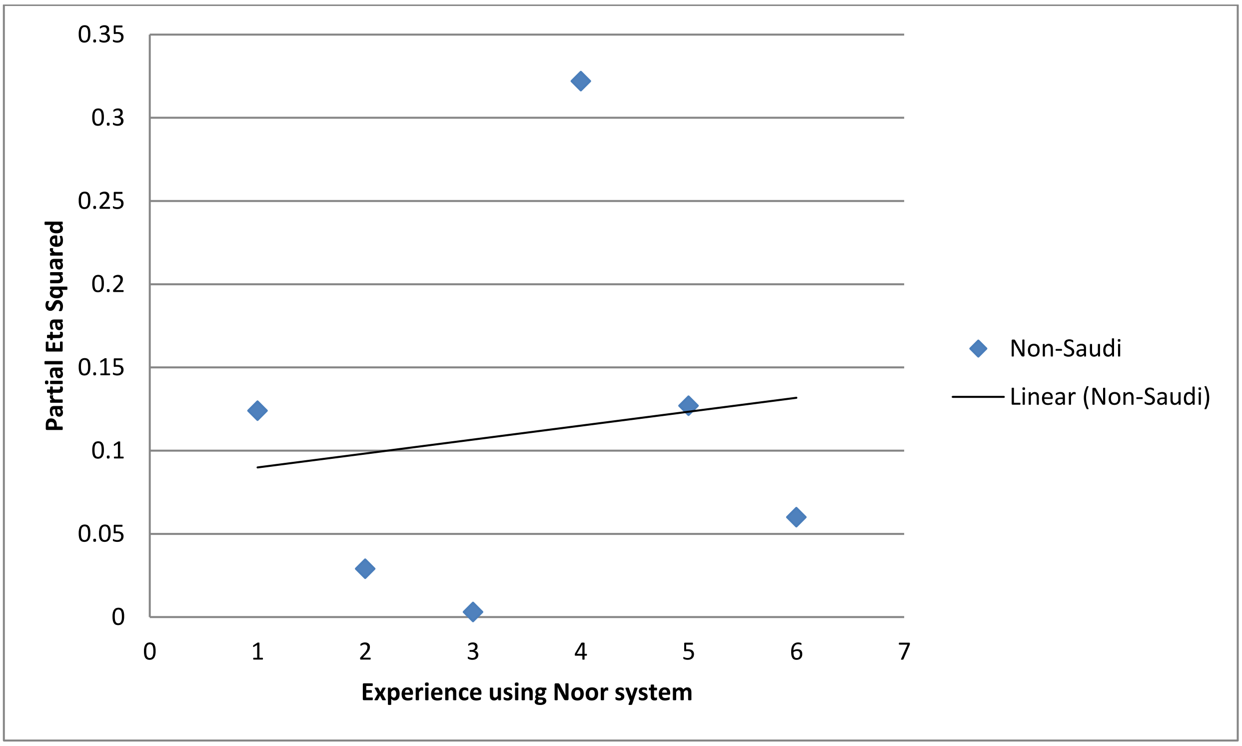

Figure 11-7: The interactive effect of Subjective Norm* Voluntariness* Experience using Noor system on Behavioural Intention among the Saudis Teachers'.

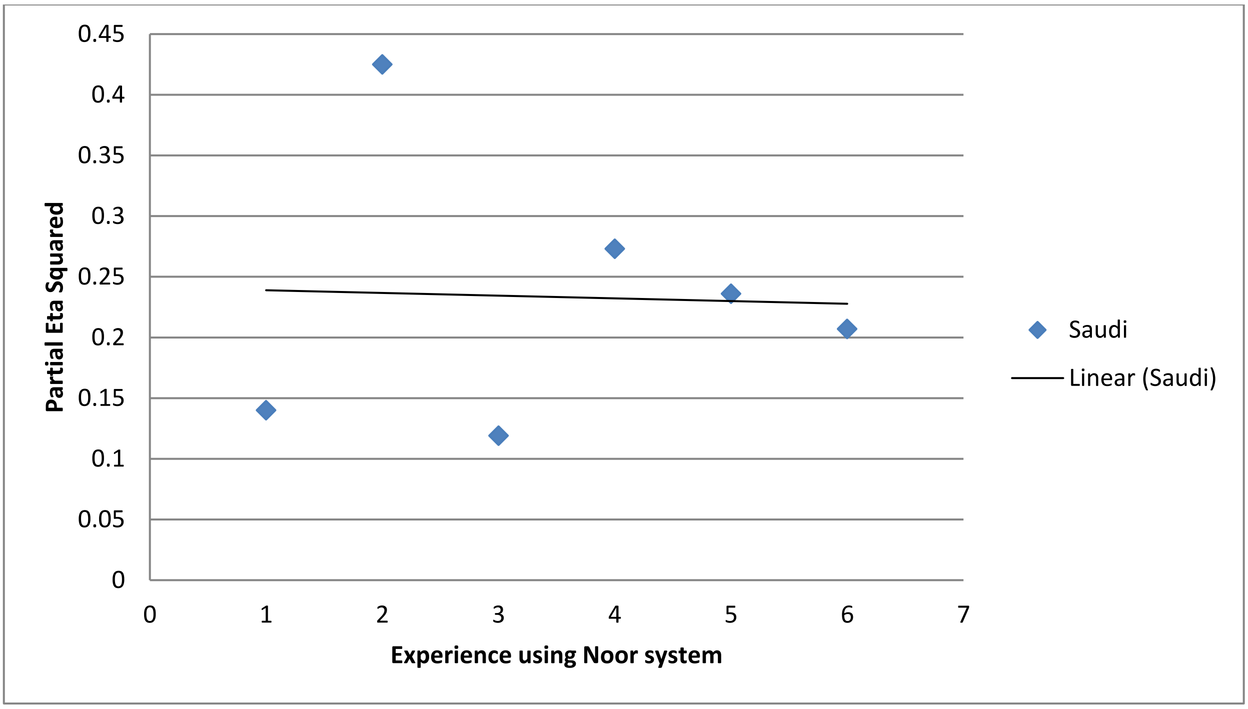

Figure 11-8: The interactive effect of Subjective Norm* Voluntariness* Experience using Noor system on Behavioural Intention among the Saudis Students' under the voluntary setting.

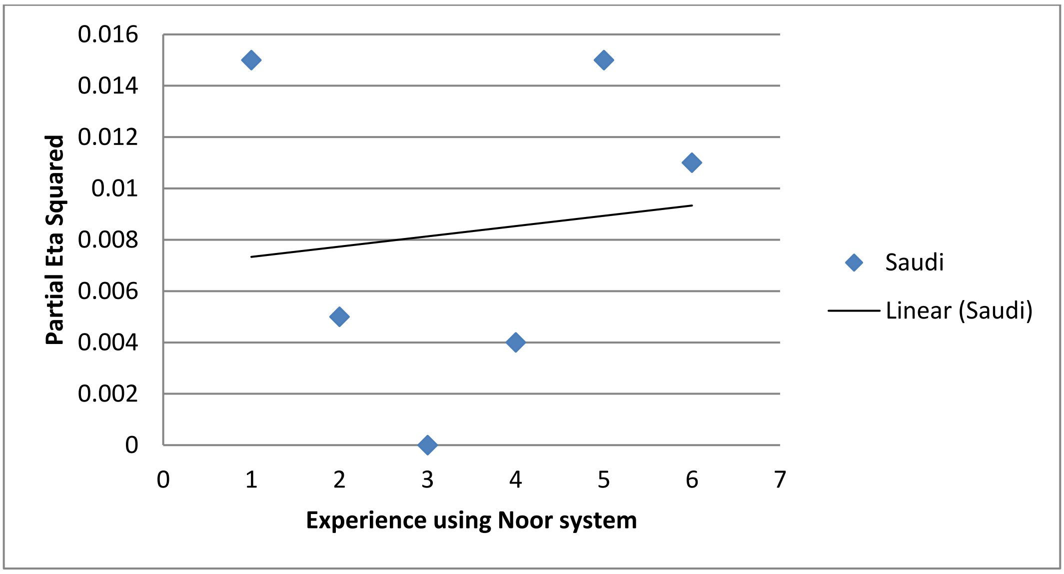

Table 11.18: Univariate test on Voluntariness * Subject Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Voluntariness * Subject Norm * Experience

Group	Nationality	*p* value	Partial Eta Squared
Students'	non-Saudis	0.151	0.002
	Saudi	0.723	0
Parents'	non-Saudis	0.021	0.004
	Saudi	0.29	0

Table 11.19: Univariate test on Subject Norm on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness

Independent variable: Subject Norm

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.452
	Saudi	<.001	0.544
Students'	non-Saudis	<.001	0.396
	Saudi	<.001	0.469
Parents'	non-Saudis	<.001	0.357
	Saudi	<.001	0.449

Figure 11-9: The interaction effect of Subjective Norm* Experience using Noor system on Perceived Usefulness among the non-Saudis Teachers'.

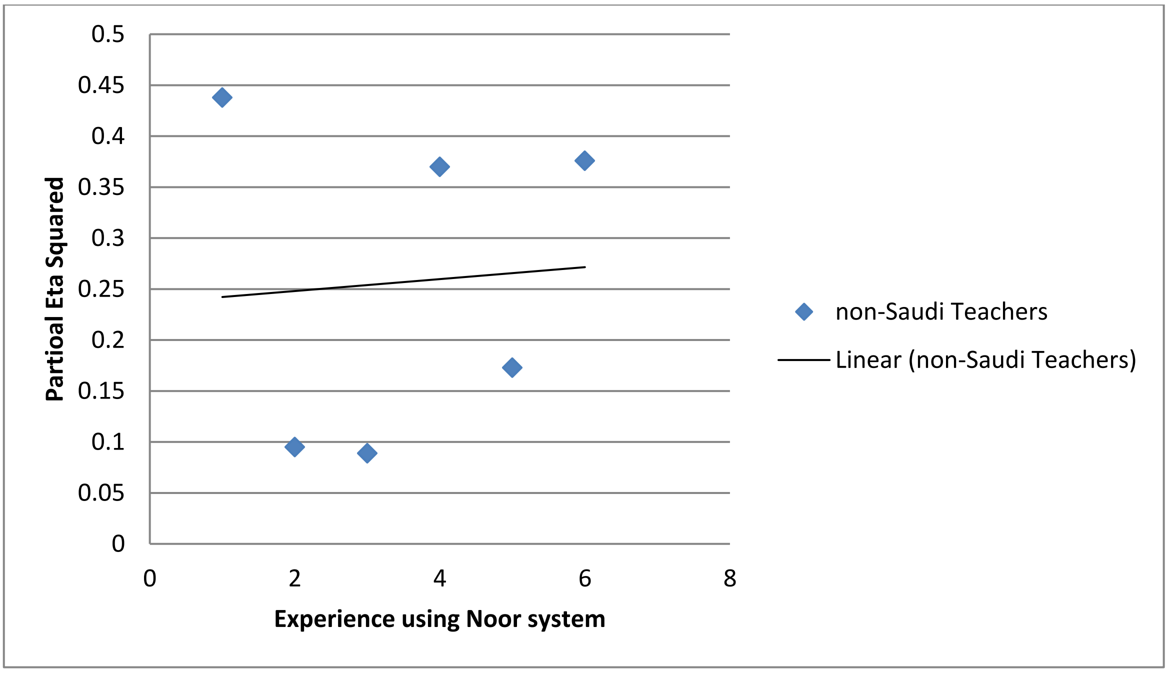

Figure 11-10: The interaction effect of Subjective Norm* Experience using Noor system on Perceived Usefulness among the Saudis Teachers'.

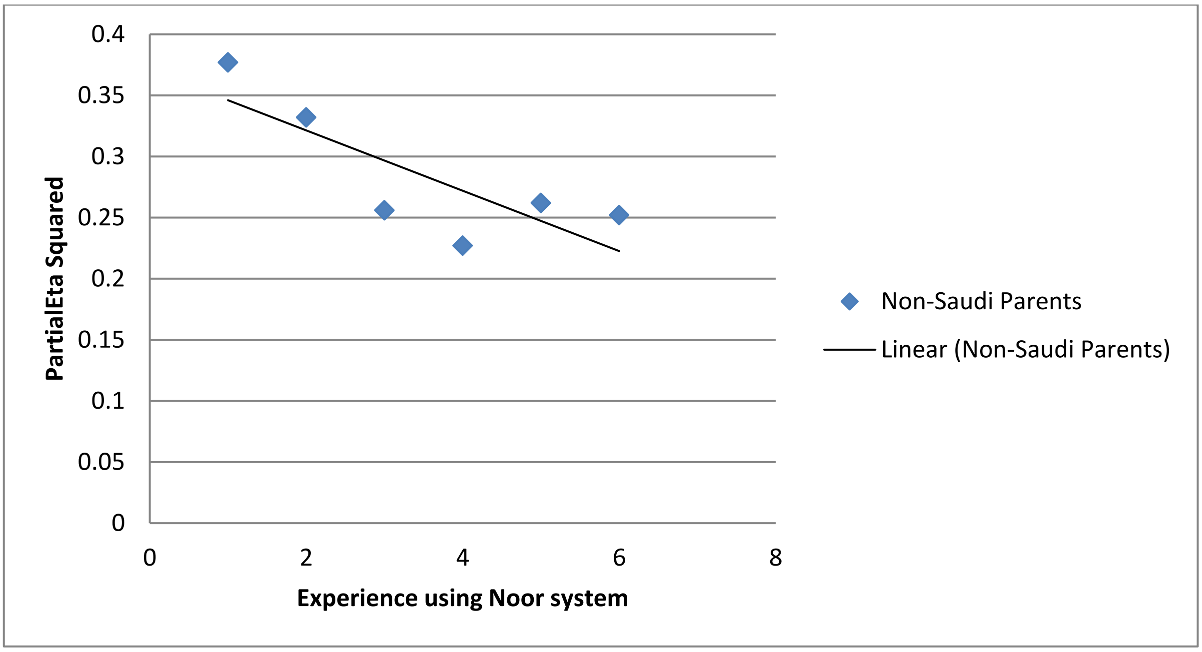

Table 11.20: Univariate test on Experience * Subject Norm on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness

Independent variable: Experience * Subject Norm

Nationality	Experience Using Noor	Teachers' *p* value	Partial Eta Squared	Students' *p* value	Partial Eta Squared	Parents' *p* value	Partial Eta Squared
non-Saudis	Less than 6 months	0.001	0.438	<.001	0.564	<.001	0.377
	6-12 months	0.117	0.095	<.001	0.43	<.001	0.332
	1-2 years	0.036	0.089	<.001	0.272	<.001	0.256
	2-3 years	<.001	0.37	<.001	0.392	<.001	0.227
	3-4 years	0.031	0.173	<.001	0.365	<.001	0.262
	4 years or more	<.001	0.376	<.001	0.446	<.001	0.252
Saudi	Less than 6 months	<.001	0.483	<.001	0.495	<.001	0.567
	6-12 months	<.001	0.594	<.001	0.558	<.001	0.305
	1-2 years	<.001	0.579	<.001	0.462	<.001	0.446
	2-3 years	<.001	0.581	<.001	0.411	<.001	0.391
	3-4 years	<.001	0.497	<.001	0.389	<.001	0.428
	4 years or more	<.001	0.469	<.001	0.544	<.001	0.447

Table 11.21: Univariate test of Subject Norm on Image; tests of Between-Subjects Effects.

Dependent Variable: Image
Independent variable: Subject Norm

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.222
	Saudi	<.001	0.346
Students’	non-Saudis	<.001	0.299
	Saudi	<.001	0.37
Parents’	non-Saudis	<.001	0.36
	Saudi	<.001	0.381

Table 11.22: Univariate test of Image on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness
Independent variable: Image

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.233
	Saudi	<.001	0.327
Students’	non-Saudis	<.001	0.3
	Saudi	<.001	0.355
Parents’	non-Saudis	<.001	0.291
	Saudi	<.001	0.296

Table 11.23: Univariate test of Job Relevance on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness
Independent variable: Job Relevance

Group	Nationality	*p* value	Partial Eta Squared
Teachers’	non-Saudis	<.001	0.503
	Saudi	<.001	0.464
Students’	non-Saudis	<.001	0.539
	Saudi	<.001	0.572
Parents’	non-Saudis	<.001	0.539
	Saudi	<.001	0.563

Table 11.24: Univariate test of Job Relevance * Output Quality on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness
Independent variable: Job Relevance * Output Quality

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.324
	Saudi	<.001	0.056
Students'	non-Saudis	<.001	0.09
	Saudi	<.001	0.047
Parents'	non-Saudis	<.001	0.188
	Saudi	<.001	0.111

Table 11.25: Univariate test of Results Demonstrability on Perceived Usefulness; tests of Between-Subjects Effects.

Dependent Variable: Perceived Usefulness
Independent variable: Results Demonstrability

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.385
	Saudi	<.001	0.423
Students'	non-Saudis	<.001	0.31
	Saudi	<.001	0.353
Parents'	non-Saudis	<.001	0.332
	Saudi	<.001	0.403

Table 11.26: Univariate test of Computer Self-Efficacy on Perceived Ease of Use; tests of Between-Subjects Effects.

Dependent Variable: Perceived Ease of Use
Independent variable: Computer Self-Efficacy

Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.057
	Saudi	<.001	0.131
Students'	non-Saudis	<.001	0.109
	Saudi	<.001	0.133
Parents'	non-Saudis	<.001	0.062
	Saudi	<.001	0.091

Table 11.27: Univariate test of Perceptions of External Control on Perceived Ease of Use; tests of Between-Subjects Effects.

Dependent Variable: Perceived Ease of Use			
Independent variable: Perceptions of External Control			
Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	<.001	0.611
	Saudi	<.001	0.676
Students'	non-Saudis	<.001	0.59
	Saudi	<.001	0.637
Parents'	non-Saudis	<.001	0.578
	Saudi	<.001	0.68

Table 11.28: Univariate test of Computer Anxiety on Perceived Ease of Use; tests of Between-Subjects Effects.

Dependent Variable: Perceived Ease of Use			
Independent variable: Computer Anxiety			
Group	Nationality	*p* value	Partial Eta Squared
Teachers'	non-Saudis	0.148	0.008
	Saudi	0.355	0.001
Students'	non-Saudis	0.092	0.003
	Saudi	<.001	0.014
Parents'	non-Saudis	0.826	0
	Saudi	<.001	0.017

Table 11.29: Univariate test of Computer Anxiety * Experience on Perceived Ease of Use; tests of Between-Subjects Effects.

Dependent Variable: Perceived Ease of Use							
Independent variable: Computer Anxiety * Experience							
		Teachers'		Students'		Parents'	
Nationality	Experience Using Noor	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
non-Saudis	Less than 6 months	0.001	0.405	0.035	0.041	0.91	0
	6-12 months	0.73	0.005	0.044	0.034	0.587	0.002
	1-2 years	0.234	0.029	0.492	0.003	0.753	0
	2-3 years	0.089	0.056	0.377	0.004	0.811	0
	3-4 years	0.385	0.03	0.891	0	0.537	0.002
	4 years or more	0.957	0	0.847	0	0.658	0.001
Saudi	Less than 6 months	0.454	0.008	<.001	0.076	<.001	0.042
	6-12 months	0.39	0.011	0.027	0.018	0.472	0.001
	1-2 years	0.762	0.001	0.003	0.017	<.001	0.028
	2-3 years	0.667	0.001	0.168	0.003	0.001	0.015
	3-4 years	0.487	0.002	0.563	0.001	0.051	0.008
	4 years or more	0.08	0.005	<.001	0.031	0.001	0.013

Table 11.30: Univariate test of Perceived Enjoyment on Perceived Ease of Use; tests of Between-Subjects Effects.

Group	Nationality	*p* value	Partial Eta Squared
Dependent Variable: Perceived Ease of Use			
Independent variable: Perceived Enjoyment			
Teachers’	non-Saudis	<.001	0.395
	Saudi	<.001	0.56
Students’	non-Saudis	<.001	0.411
	Saudi	<.001	0.504
Parents’	non-Saudis	<.001	0.543
	Saudi	<.001	0.611

Table 11.31: Univariate test of Experience * Enjoyment on Perceived Ease of Use; tests of Between-Subjects Effects.

Dependent Variable: Perceived Ease of Use

Independent variable: Experience * Perceived Enjoyment

		Teachers’		Students’		Parents’	
Nationality	Experience Using Noor	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partia Squar
non-Saudis	Less than 6 months	<.001	0.504	<.001	0.453	<.001	0.599
	6-12 months	<.001	0.401	<.001	0.493	<.001	0.566
	1-2 years	<.001	0.308	<.001	0.386	<.001	0.559
	2-3 years	<.001	0.38	<.001	0.459	<.001	0.505
	3-4 years	0.003	0.297	<.001	0.332	<.001	0.526
	4 years or more	<.001	0.357	<.001	0.391	<.001	0.48
Saudi	Less than 6 months	<.001	0.572	<.001	0.597	<.001	0.656
	6-12 months	<.001	0.485	<.001	0.578	<.001	0.579
	1-2 years	<.001	0.572	<.001	0.493	<.001	0.648
	2-3 years	<.001	0.619	<.001	0.474	<.001	0.614
	3-4 years	<.001	0.56	<.001	0.405	<.001	0.586
	4 years or more	<.001	0.551	<.001	0.554	<.001	0.578

Table 11.32: Univariate test (Age): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subject Norm

		Teachers'		Parents'		Students'		
Nationality	Age	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	Age	*p* value	Partial Eta Squared
non-Saudis	18 to 25 years	0.57	0.119	0.002	0.289	Under 15 years	<.001	0.47
	25 to 35 years	<.001	0.404	<.001	0.329	15 to 16 years	<.001	0.313
	35 to 45 years	<.001	0.174	<.001	0.186	16 to 17 years	<.001	0.169
	45 to 55 years	0.012	0.159	<.001	0.134	17 to 18 years	<.001	0.359
	Age 55 or older	<.001	0.921	0.001	0.247	18 to 25 years	<.001	0.412
Saudi	18 to 25 years	<.001	0.791	<.001	0.452	Under 15 years	<.001	0.425
	25 to 35 years	<.001	0.434	<.001	0.352	15 to 16 years	<.001	0.286
	35 to 45 years	<.001	0.352	<.001	0.328	16 to 17 years	<.001	0.335
	45 to 55 years	<.001	0.337	<.001	0.237	17 to 18 years	<.001	0.285
	Age 55 or older	0.004	0.438	<.001	0.271	18 to 25 years	<.001	0.439

Figure 11-11: The effect size of age on the relationship between Subjective Norm and Behavioural Intention among the non-Saudis Teachers'.

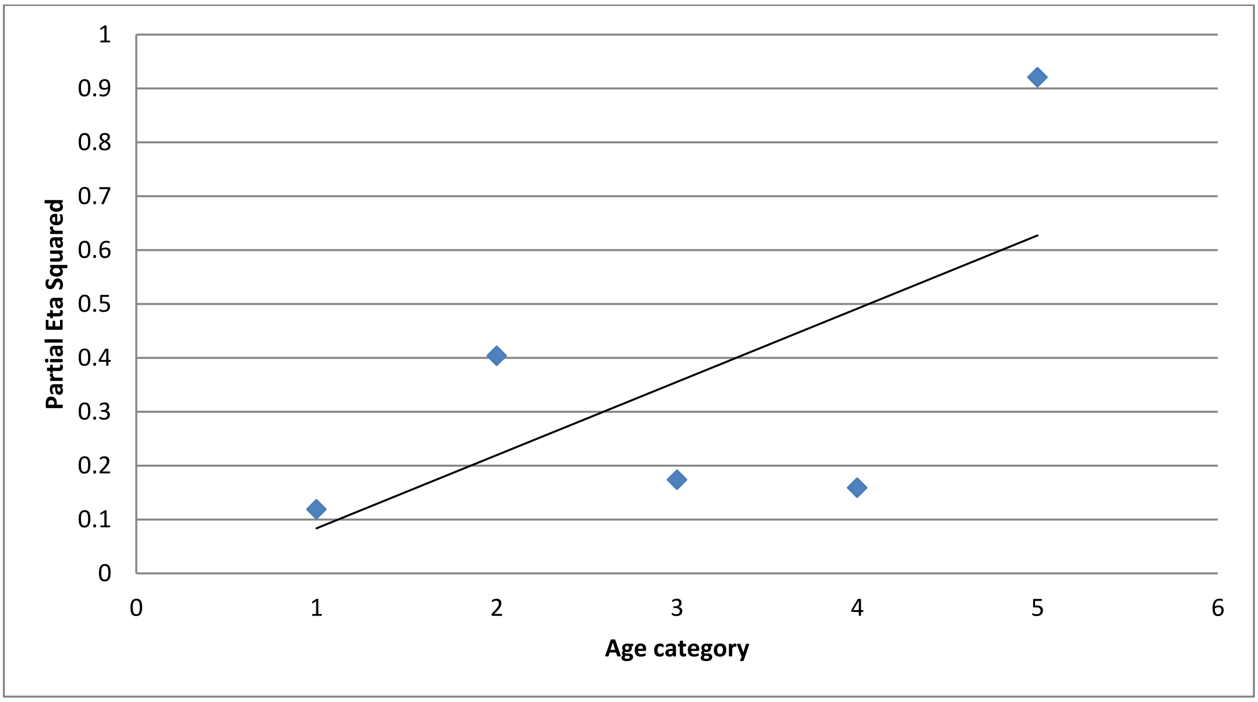

Table 11.33: Univariate test (Gender): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention				
Independent Variable: Subject Norm				
Group	Nationality	Gender	*p* value	Partial Eta Squared
	non-Saudis	Female	<.001	0.768
Teachers’		Male	<.001	0.258
	Saudi	Female	<.001	0.435
		Male	<.001	0.378
	non-Saudis	Female	<.001	0.317
Students’		Male	<.001	0.336
	Saudi	Female	<.001	0.338
		Male	<.001	0.368
	non-Saudis	Female	0.002	0.12
Parents’		Male	<.001	0.2
	Saudi	Female	<.001	0.292
		Male	<.001	0.313

Table 11.34: Univariate test (Used Noor system help and support): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention				
Independent Variable: Subjective Norm				
Group	Nationality	Used Noor system help and support	*p* value	Partial Eta Squared
Teachers’	non-Saudis	No	<.001	0.21
		Yes	<.001	0.377
	Saudi	No	<.001	0.393
		Yes	<.001	0.399
Students’	non-Saudis	No	<.001	0.316
		Yes	<.001	0.356
	Saudi	No	<.001	0.35
		Yes	<.001	0.381
	non-Saudis	No	<.001	0.19
Parents’		Yes	<.001	0.204
	Saudi	No	<.001	0.306
		Yes	<.001	0.313

Table 11.35: Univariate test (Internet access at home): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

Group	Nationality	Internet Access Home	*p* value	Partial Eta Squared
Teachers'	non-Saudis	No	<.001	0.556
		Yes	<.001	0.246
	Saudi	No	<.001	0.665
		Yes	<.001	0.385
Students'	non-Saudis	No	<.001	0.568
		Yes	<.001	0.316
	Saudi	No	<.001	0.662
		Yes	<.001	0.343
Parents'	non-Saudis	No	<.001	0.293
		Yes	<.001	0.19
	Saudi	No	<.001	0.384
		Yes	<.001	0.309

Table 11.36: Univariate test (Internet experience): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

		Teachers'		Students'		Parents'	
Nationality	Internet Experience	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
non-Saudis	Less than 6 months	0.02	0.96	<.001	0.781	<.001	0.508
	6-12 months	Nil	Nil	0.001	0.414	0.014	0.29
	1-2 years	0.895	0.027	<.001	0.377	0.002	0.242
	2-3 years	0.259	0.205	<.001	0.365	0.002	0.153
	3-4 years	0.666	0.025	<.001	0.266	<.001	0.219
	4-8 years	<.001	0.228	<.001	0.291	<.001	0.193
	8-12 years	<.001	0.2	<.001	0.214	<.001	0.229
	12 years or more	<.001	0.294	<.001	0.435	<.001	0.173
Saudi	Less than 6 months	<.001	0.932	<.001	0.574	<.001	0.443
	6-12 months	0.005	0.821	<.001	0.442	<.001	0.259
	1-2 years	0.002	0.471	<.001	0.534	<.001	0.509
	2-3 years	0.014	0.434	<.001	0.405	<.001	0.229
	3-4 years	<.001	0.354	<.001	0.332	<.001	0.431
	4-8 years	<.001	0.445	<.001	0.274	<.001	0.312
	8-12 years	<.001	0.44	<.001	0.331	<.001	0.261
	12 years or more	<.001	0.37	<.001	0.418	<.001	0.308

Table 11.37: Univariate test (Internet proficiency): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

Nationality	Internet Proficiency	Teachers' *p* value	Teachers' Partial Eta Squared	Students' *p* value	Students' Partial Eta Squared	Parents' *p* value	Parents' Partial Eta Squared
non-Saudis	Very Low	0.388	0.672	Nil	0	<.001	0.826
	Low	Nil	1	0.529	0.084	0.056	0.222
	Satisfactory	0.002	0.474	<.001	0.26	<.001	0.176
	Good	0.067	0.119	<.001	0.35	<.001	0.168
	Very Good	<.001	0.331	<.001	0.315	<.001	0.245
	Excellent	<.001	0.227	<.001	0.324	<.001	0.157
Saudi	Very Low	<.001	0.863	<.001	0.709	<.001	0.505
	Low	0.008	0.52	<.001	0.485	<.001	0.532
	Satisfactory	<.001	0.325	<.001	0.32	<.001	0.307
	Good	<.001	0.403	<.001	0.374	<.001	0.257
	Very Good	<.001	0.414	<.001	0.299	<.001	0.265
	Excellent	<.001	0.385	<.001	0.371	<.001	0.362

Figure 11-12: The effect of internet proficiency on the relationship between Subjective Norm and Behavioural Intention among the non-Saudis Students'.

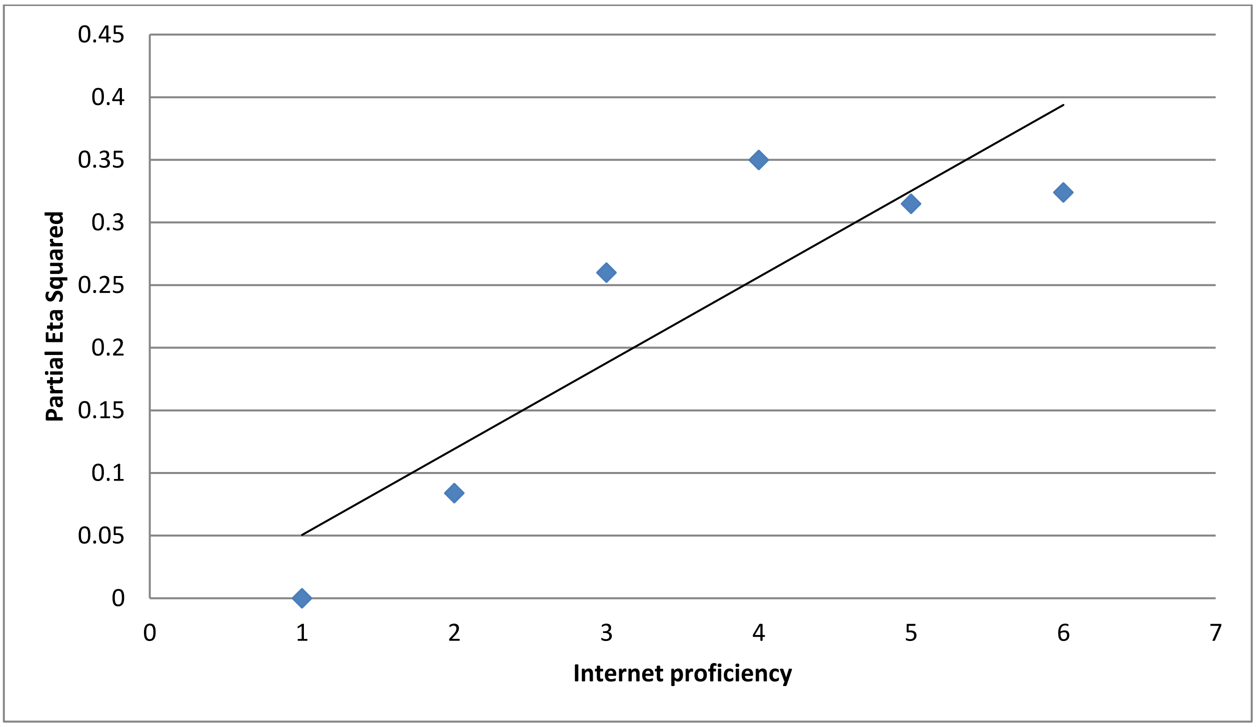

Table 11.38: Univariate test (Average time for using the internet): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

		Teachers'		Students'		Parents'	
Nationality	Average time for using the Internet	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
non-Saudis	Less than 30 minutes	<.001	0.708	<.001	0.652	<.001	0.301
	30 minutes – 1 hour	0.169	0.042	<.001	0.256	<.001	0.109
	1– 2 hours	<.001	0.326	<.001	0.325	<.001	0.221
	2– 3 hours	<.001	0.352	<.001	0.32	<.001	0.179
	More than 3 hours	<.001	0.277	<.001	0.312	<.001	0.194
Saudi	Less than 30 minutes	<.001	0.396	<.001	0.492	<.001	0.376
	30 minutes – 1 hour	<.001	0.33	<.001	0.346	<.001	0.281
	1– 2 hours	<.001	0.368	<.001	0.458	<.001	0.283
	2– 3 hours	<.001	0.383	<.001	0.286	<.001	0.293
	More than 3 hours	<.001	0.452	<.001	0.334	<.001	0.33

Figure 11-13: The effect of average time for using the internet on the relationship between Subjective Norm and Behavioural Intention among the Saudis Teachers'.

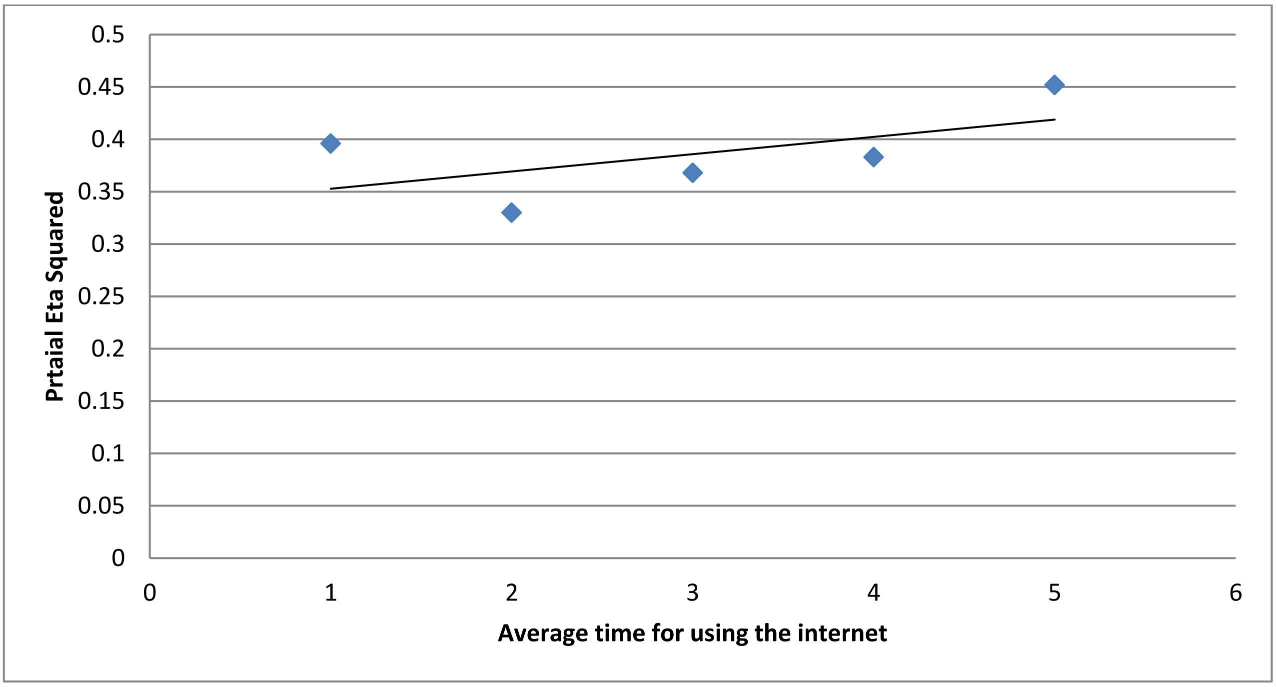

Figure 11-14: The effect of educational level on the relationship between Subjective Norm and Behavioural Intention among non-Saudis Teachers'.

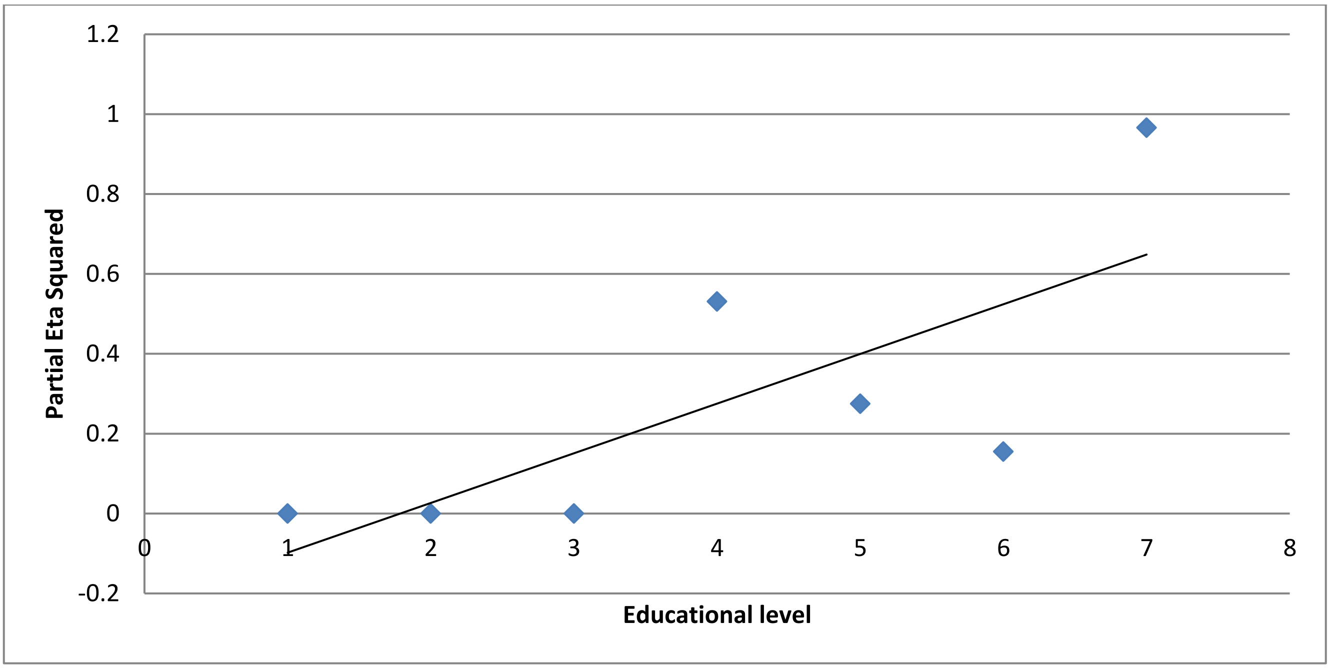

Figure 11-15: The effect of education level on the relationship between Subjective Norm and Behavioural Intention among Saudis Parents'.

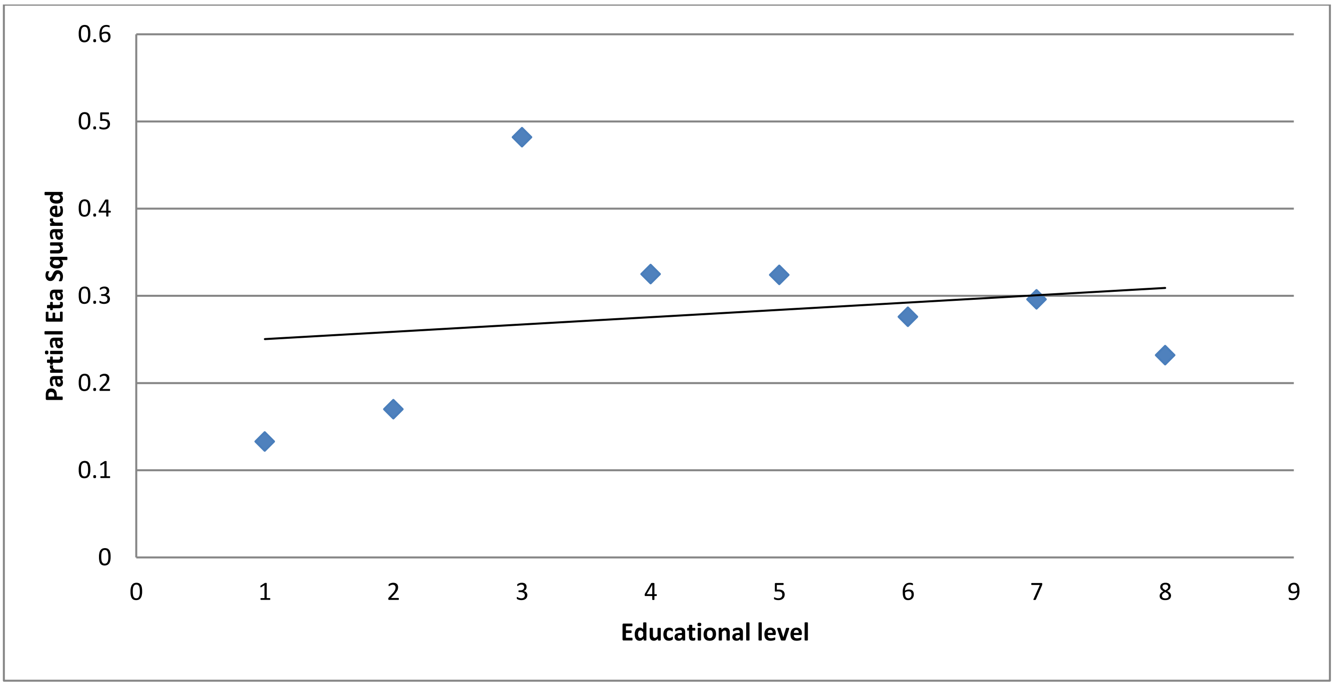

Figure 11-16: The effect of education level on the relationship between Subjective Norm and Behavioural Intention among Saudis Teachers'.

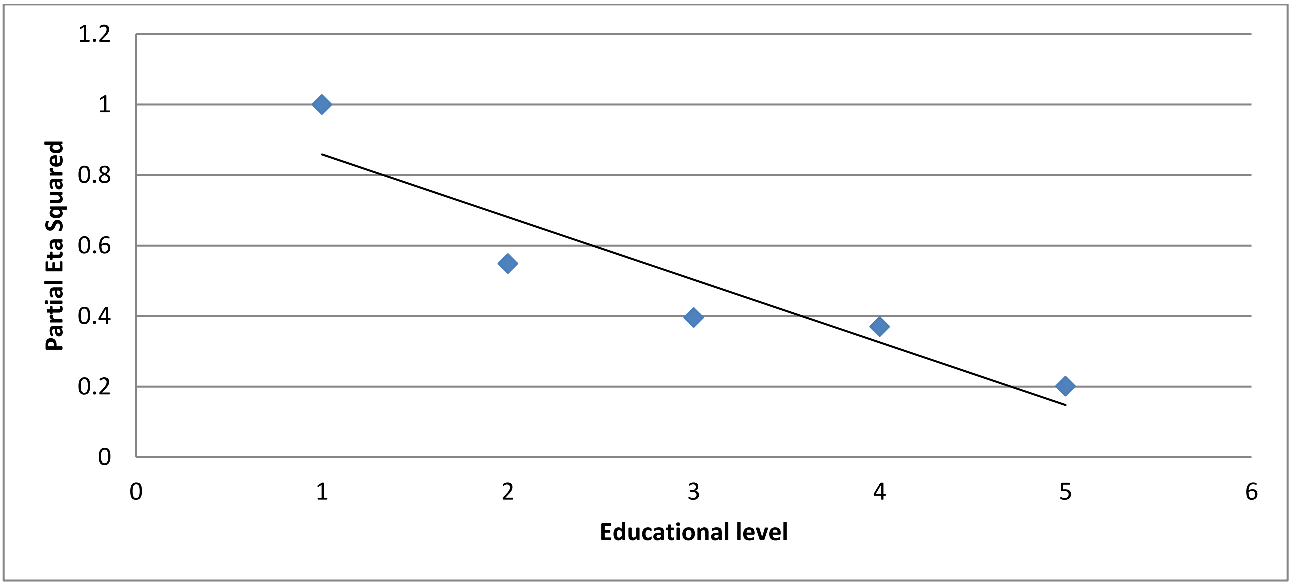

Figure 11-17: The effect of educational level on the relationship between Subjective Norm and Behavioural Intention among non-Saudis Parents'.

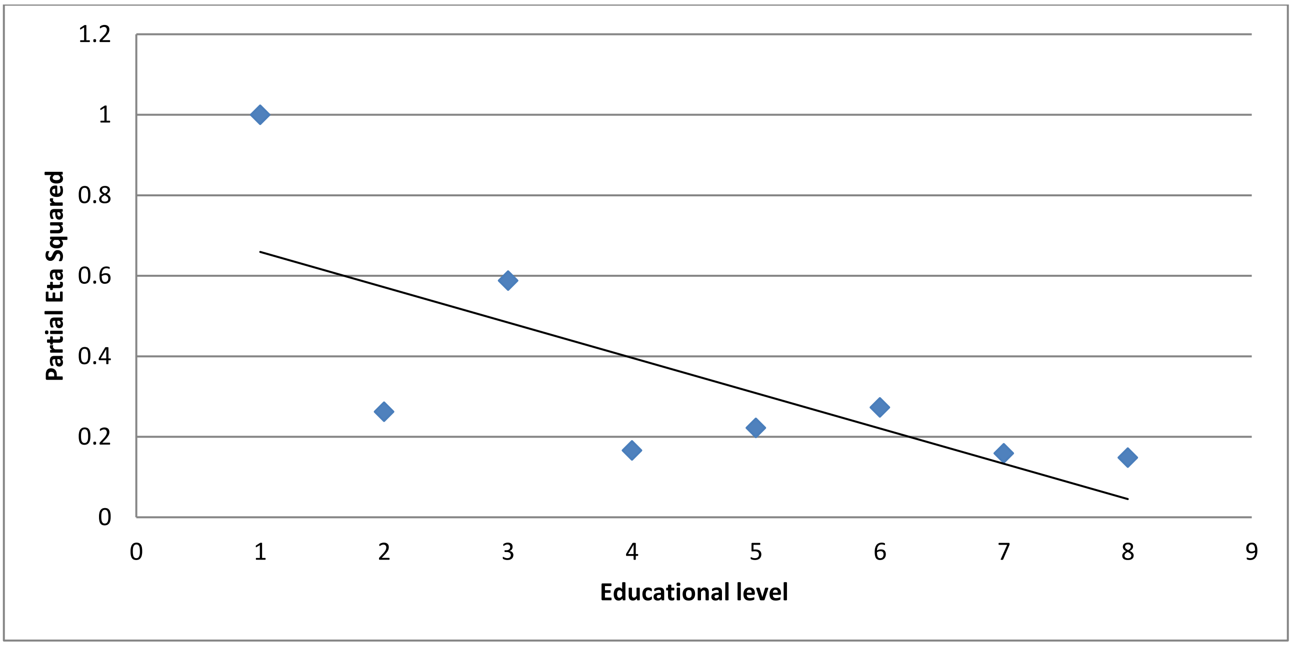

Table 11.39: Univariate test (Education level): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

		non-Saudis		Saudi	
Group	Education Level	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
Teachers'	Primary School	Nil	Nil	Nil	Nil
	Intermediate School	Nil	Nil	Nil	Nil
	Secondary School	Nil	Nil	Nil	1
	Diploma Degree	0.063	0.531	<.001	0.549
	Bachelor Degree	<.001	0.275	<.001	0.396
	Master Degree	0.031	0.155	<.001	0.37
	PhD or higher	0.118	0.966	0.144	0.201
Parents'	No Formal Education	Nil	1	0.762	0.133
	Primary School	0.658	0.262	0.491	0.17
	Intermediate School	<.001	0.588	<.001	0.482
	Secondary School	<.001	0.166	<.001	0.325
	Diploma Degree	<.001	0.222	<.001	0.324
	Bachelor Degree	<.001	0.273	<.001	0.276
	Master Degree	<.001	0.159	<.001	0.296
	PhD or higher	<.001	0.148	<.001	0.232
	Other	0.242	0.041	<.001	0.231

Figure 11-18: The effect of monthly income on the relationship between Subjective Norm and Behavioural Intention among the non-Saudis Teachers'.

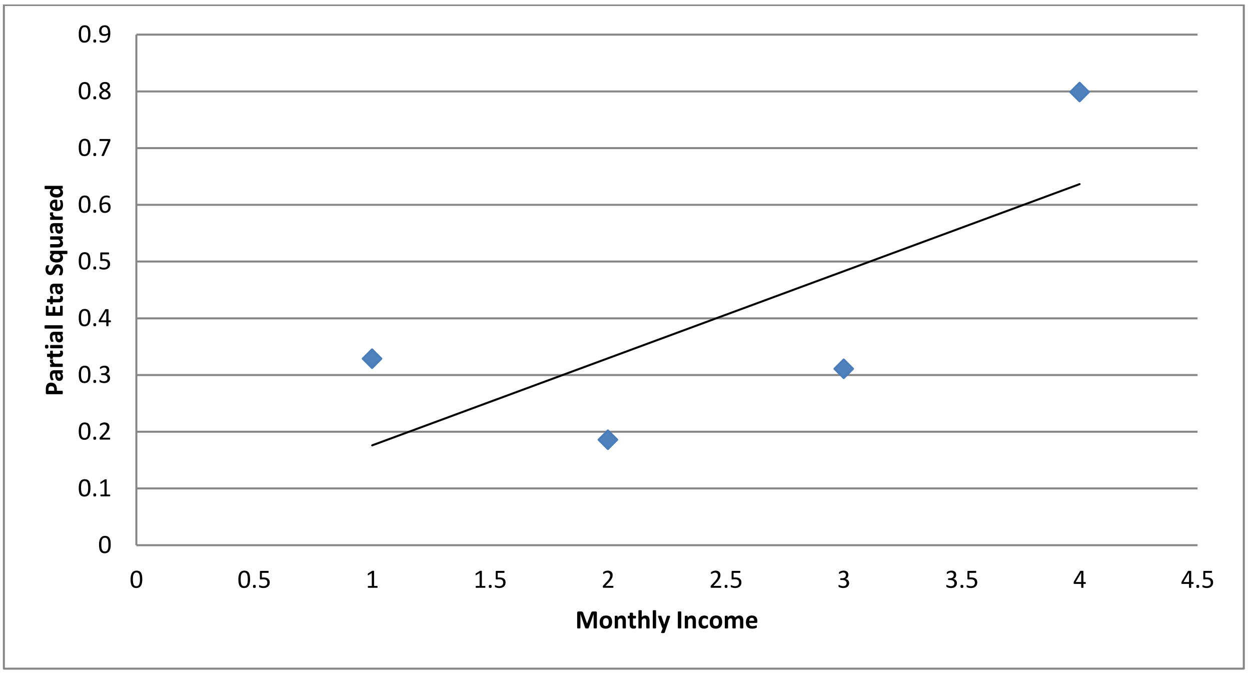

Figure 11-19: The effect of monthly income on the relationship between Subjective Norm and Behavioural Intention among the non-Saudis Parents'.

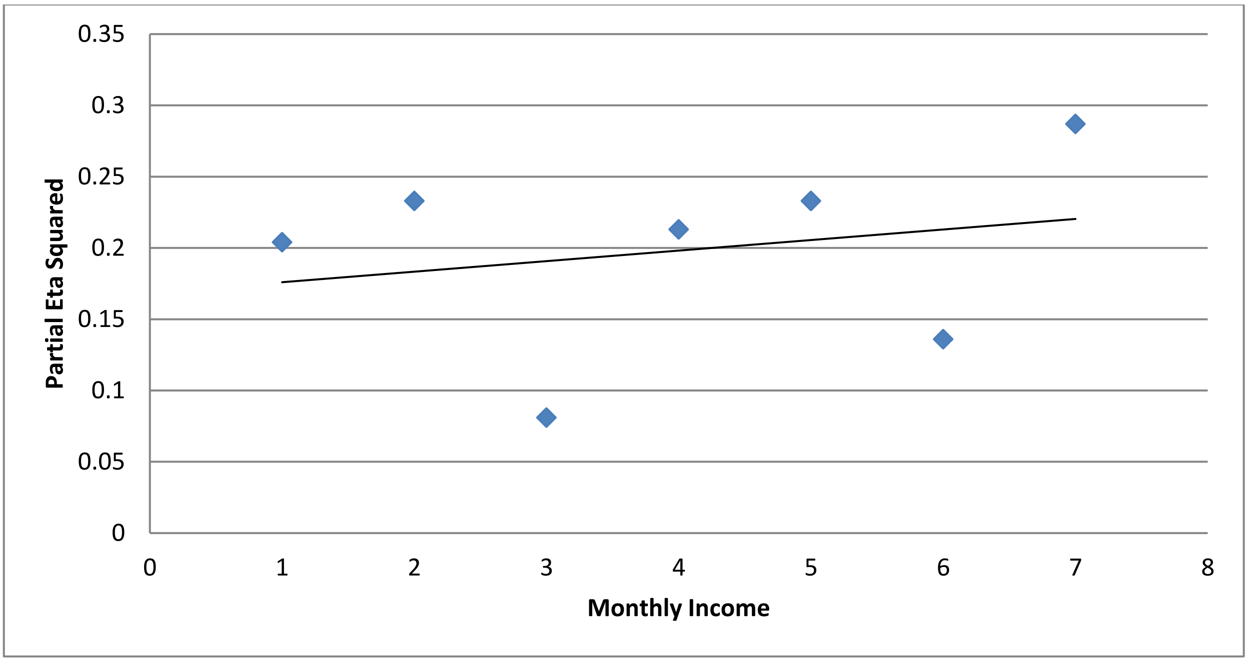

Figure 11-20: The effect of monthly income on the relationship between Subjective Norm and Behavioural Intention among the Saudis Teachers'.

Figure 11-21: The effect of monthly income on the Subjective Norm and Behavioural Intention among the Saudis Parents'.

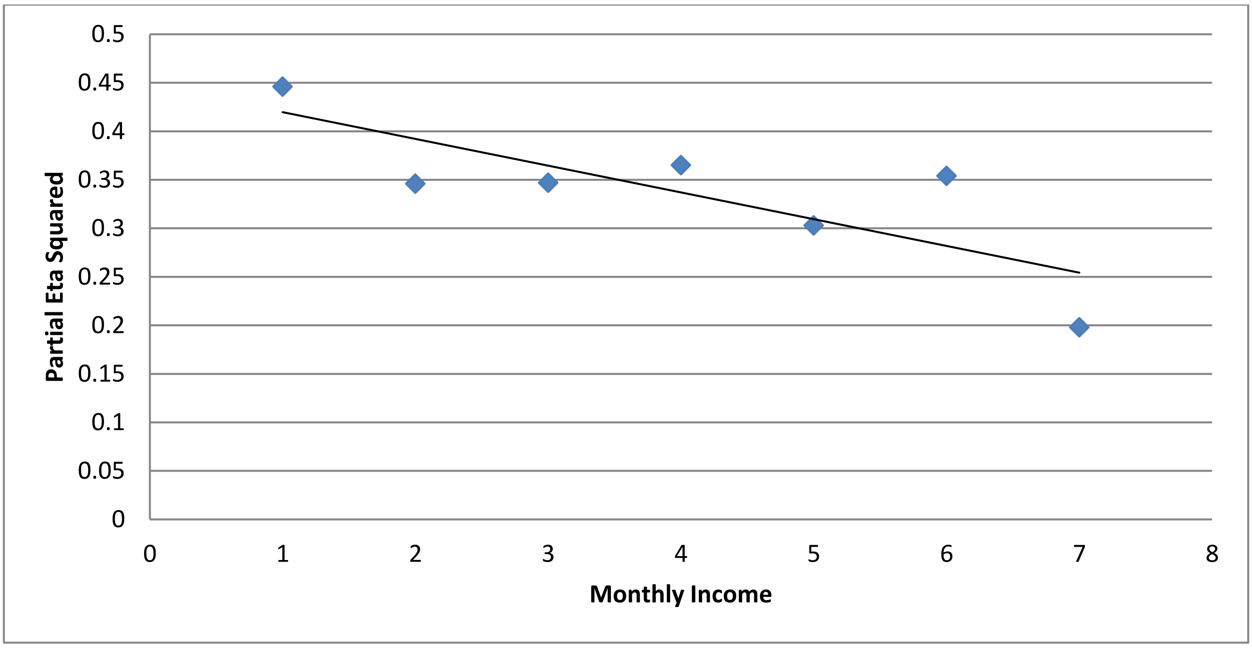

Table 11.40Univariate test (Monthly income): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm

		Teachers'		Parents'	
Nationality	Monthly Income	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
non-Saudis	Less than SR3,000	<.001	0.329	<.001	0.204
	SR3,000 to SR5,999	<.001	0.186	<.001	0.233
	SR6,000 to SR8,999	0.048	0.311	<.001	0.081
	SR9,000 to SR11,999	0.016	0.799	<.001	0.213
	SR12,000 to SR14,999	_	_	<.001	0.233
	SR15,000 to SR17,999			0.041	0.136
	SR18,000 or more	_	_	<.001	0.287
	NA			<.001	0.238
Saudi	Less than SR3,000	0.006	0.455	<.001	0.446
	SR3,000 to SR5,999	<.001	0.5	<.001	0.346
	SR6,000 to SR8,999	<.001	0.538	<.001	0.347
	SR9,000 to SR11,999	<.001	0.401	<.001	0.365
	SR12,000 to SR14,999	<.001	0.356	<.001	0.303
	SR15,000 to SR17,999	<.001	0.389	<.001	0.354
	SR18,000 or more	<.001	0.344	<.001	0.198
	NA	_	_	<.001	0.324

Note: NA means not officially employed

Table 11.41: Univariate test (Job region): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm

Group	Nationality	Job Region	*p* value	Partial Eta Squared
Teachers’	non-Saudis	Central Region	<.001	0.271
		West Region	<.001	0.209
		East Region	0.07	0.513
		North Region	0.014	0.325
		South Region	.	1
		Working in the diaspora	.	.
	Saudi	Central Region	<.001	0.386
		West Region	<.001	0.383
		East Region	0.148	0.555
		North Region	0.003	1
		South Region	0.001	0.918
Parents’	non-Saudis	Central Region	<.001	0.239
		West Region	<.001	0.159
		East Region	0.072	0.442
		North Region	<.001	0.58
		South Region	0.046	0.193
		Working in the diaspora	.	.
		NA	<.001	0.238
		Central Region	<.001	0.308
		West Region	<.001	0.304
		East Region	0.003	0.279
	Saudi	North Region	<.001	0.353
		South Region	<.001	0.3
		Working in the diaspora	0.011	0.685
		NA	<.001	0.324

Table 11.42: Univariate test (Internet access at work): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

Group	Nationality	Internet Access-Work	*p* value	Partial Eta Squared
Teachers'	non-Saudis	No	<.001	0.502
		Yes	<.001	0.275
	Saudi	No	<.001	0.383
		Yes	<.001	0.4
Parents'	non-Saudis	No	<.001	0.148
		Yes	<.001	0.2
		NA	<.001	0.238
	Saudi	No	<.001	0.393
		Yes	<.001	0.302
		NA	<.001	0.324

Table 11.43: Univariate test (Attending training): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm

Group	Nationality	Attending Training	*p* value	Partial Eta Squared
Teachers'	non-Saudis	No	<.001	0.189
		Yes	<.001	0.569
	Saudi	No	<.001	0.384
		Yes	<.001	0.501
Students'	non-Saudis	No	<.001	0.339
		Yes	<.001	0.254
	Saudi	No	<.001	0.348
		Yes	<.001	0.499
Parents'	non-Saudis	No	<.001	0.192
		Yes	<.001	0.325
	Saudi	No	<.001	0.3
		Yes	<.001	0.413

Table 11.44: Univariate test (Receiving support with Noor system account): Subjective Norm on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm

Group	Nationality	Receiving Support with Noor system account	*p* value	Partial Eta Squared
Teachers’	non-Saudis	No	<.001	0.278
		Yes	<.001	0.329
	Saudi	No	<.001	0.399
		Yes	<.001	0.379
Students’	non-Saudis	No	<.001	0.318
		Yes	<.001	0.344
	Saudi	No	<.001	0.351
		Yes	<.001	0.364
Parents’	non-Saudis	No	<.001	0.19
		Yes	<.001	0.197
	Saudi	No	<.001	0.291
		Yes	<.001	0.365

Table 11.45; Teachers’ Univariate test (Group * Nationality * Gender * Education level): Subjective Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm * Experience

Group	Nationality	Gender	Education Level	*p* value	Partial Eta Squared
Teachers’	non-Saudis	Female	Primary School	_	_
			Diploma Degree	_	1
			Bachelor Degree	0.023	0.498
			Master Degree	_	_
		Male	Intermediate School	_	_
			Secondary School	_	_
			Diploma Degree	0.168	0.522
			Bachelor Degree	0.626	0.001
			Master Degree	0.152	0.077
			PhD or higher	0.988	0
	Saudi	Female	Secondary School	0.546	0.428
			Diploma Degree	0.574	0.015
			Bachelor Degree	0.001	0.053
			Master Degree	0.832	0.003
			PhD or higher	_	_
		Male	Primary School	_	1
			Diploma Degree	0.001	0.226
			Bachelor Degree	<.001	0.097
			Master Degree	<.001	0.128
			PhD or higher	0.522	0.047

Table 11.46: Parents' Univariate test (Group X Nationality X Gender X Education level): Subjective Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent Variable: Subjective Norm * Experience

Group	Nationality	Gender	Education Level	*p* value	Partial Eta Squared
Parents'	non-Saudis	Female	Primary School	_	_
			Intermediate School	0.177	0.508
			Secondary School	0.075	0.436
			Diploma Degree	0.535	0.015
			Bachelor Degree	0.652	0.024
			Master Degree	0.851	0.002
			PhD or higher	0.793	0.102
			Other	_	1
		Male	No Formal Education	_	1
			Primary School	_	1
			Intermediate School	<.001	0.486
			Secondary School	0.595	0.004
			Diploma Degree	<.001	0.067
			Bachelor Degree	0.02	0.023
			Master Degree	0.236	0.002
			PhD or higher	0.32	0.01
			Other	0.892	0.001
	Saudi	Female	Intermediate School	0.008	0.253
			Secondary School	0.005	0.2
			Diploma Degree	0.007	0.06
			Bachelor Degree	0.123	0.034
			Master Degree	0.221	0.005
			PhD or higher	0.369	0.02
			Other	0.28	0.144
		Male	No Formal Education	0.784	0.11
			Primary School	0.475	0.181
			Intermediate School	<.001	0.151
			Secondary School	<.001	0.074
			Diploma Degree	<.001	0.057
			Bachelor Degree	0.743	0
			Master Degree	0.002	0.007
			PhD or higher	0.66	0.001
			Other	0.058	0.042

Table 11.47: Teachers' Univariate test (Group X Nationality X Gender X Education level): Subjective Norm * Experience * Voluntariness on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm * Experience * Voluntariness

Group	Nationality	Gender	Education Level	*p* value	Partial Eta Squared
Teachers'	non-Saudis	Female	Primary School	_	_
			Diploma Degree	_	1
			Bachelor Degree	0.446	0.074
			Master Degree	_	_
		Male	Intermediate School	_	_
			Secondary School	_	_
			Diploma Degree	0.106	0.637
			Bachelor Degree	0.587	0.002
			Master Degree	0.845	0.001
			PhD or higher	0.231	0.874
	Saudi	Female	Secondary School	0.13	0.959
			Diploma Degree	0.928	0
			Bachelor Degree	0.015	0.029
			Master Degree	0.463	0.032
			PhD or higher	_	_
		Male	Primary School	_	1
			Diploma Degree	<.001	0.247
			Bachelor Degree	<.001	0.075
			Master Degree	<.001	0.078
			PhD or higher	0.852	0.004

Table 11.48: Parents' Univariate test (Group X Nationality X Gender X Education level): Subjective Norm * Experience on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm * Experience * Voluntariness

Group	Nationality	Gender	Education Level	*p* value	Partial Eta Squared
Parents'	non-Saudis	Female	Primary School	_	_
			Intermediate School	0.096	0.658
			Secondary School	0.319	0.165
			Diploma Degree	0.724	0.005
			Bachelor Degree	0.201	0.175
			Master Degree	0.572	0.016
			PhD or higher	0.634	0.295
			Other	_	1
		Male	No Formal Education	_	1
			Primary School	_	1
			Intermediate School	0.002	0.399
			Secondary School	0.608	0.004
			Diploma Degree	0.03	0.014
			Bachelor Degree	0.184	0.008
			Master Degree	0.963	0
			PhD or higher	0.059	0.036
			Other	0.44	0.019
	Saudi	Female	Intermediate School	0.041	0.157
			Secondary School	0.081	0.082
			Diploma Degree	0.284	0.01
			Bachelor Degree	0.105	0.037
			Master Degree	0.003	0.03
			PhD or higher	0.125	0.058
			Other	0.836	0.006
		Male	No Formal Education	0.554	0.416
			Primary School	0.025	0.853
			Intermediate School	0.4	0.008
			Secondary School	0.203	0.008
			Diploma Degree	0.541	0.001
			Bachelor Degree	0.41	0.001
			Master Degree	0.411	0.001
			PhD or higher	0.467	0.002
			Other	0.128	0.027

Table 11.49: Univariate test (Nationality X Gender X Experience using Noor system): Subjective Norm * Experience * Voluntariness on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent Variable: Subjective Norm * Experience * Voluntariness

			Teachers'		Students'		Parents'	
Nationality	Gender	Experience Using Noor	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared	*p* value	Partial Eta Squared
non-Saudis	Female	Less than 6 months	0.181	0.501	0.525	0.02	0.613	0.015
		6-12 months	_	_	0.434	0.031	0.089	0.829
		1-2 years	_	_	0.172	0.051	0.536	0.022
		2-3 years	_	_	0.741	0.003	0.674	0.013
		3-4 years	_	_	0.709	0.004	0.201	0.195
		4 years or more	0.58	0.065	0.162	0.06	0.371	0.09
	Male	Less than 6 months	0.206	0.098	0.484	0.006	0.044	0.019
		6-12 months	0.698	0.006	0.034	0.046	0.002	0.056
		1-2 years	0.686	0.003	0.451	0.004	0.637	0.001
		2-3 years	<.001	0.32	0.074	0.018	0.375	0.003
		3-4 years	0.091	0.114	0.79	0.001	0.007	0.041
		4 years or more	0.075	0.052	0.744	0.001	0.553	0.002
Saudi	Female	Less than 6 months	0.24	0.068	0.722	0.001	0.848	0
		6-12 months	0.243	0.112	0.819	0.001	0.279	0.024
		1-2 years	0.018	0.155	0.165	0.017	0.007	0.061
		2-3 years	<.001	0.365	0.004	0.052	0.143	0.024
		3-4 years	0.189	0.04	0.014	0.045	0.005	0.13
		4 years or more	0.002	0.1	0.576	0.002	0.155	0.017
	Male	Less than 6 months	0.003	0.181	0.028	0.018	0.005	0.014
		6-12 months	<.001	0.451	0.252	0.006	0.024	0.017
		1-2 years	0.002	0.103	0.604	0.001	0.045	0.006
		2-3 years	<.001	0.25	0.914	0	0.562	0.001
		3-4 years	<.001	0.248	0.114	0.008	0.131	0.006
		4 years or more	<.001	0.217	0.006	0.021	0.009	0.01

Appendix C

Table 11.50: Items for the original TAM 3 Constructs. Source (Venkatesh and Bala, 2008, p. 313 & 314).

Constructs		Items [a]
Perceived Usefulness (PU)	PU1	Using the system improves my performance in my job.
	PU2	Using the system in my job increases my productivity.
	PU3	Using the system enhances my effectiveness in my job.
	PU4	I find the system to be useful in my job.
Perceived Ease of Use (PEOU)	PEOU1	My interaction with the system is clear and understandable.
	PEOU2	Interacting with the system does not require a lot of my mental effort.
	PEOU3	I find the system to be easy to use.
	PEOU4	I find it easy to get the system to do what I want it to do.
Computer Self-Efficacy (CSE)		I could complete the job using a software package . . .
	CSE1	. . . if there was no one around to tell me what to do as I go.
	CSE2	. . . if I had just the built-in help facility for assistance.
	CSE3	. . . if someone showed me how to do it first.
	CSE4	. . . if I had used similar packages before this one to do the same job.
Perceptions of External Control (PEC)	PEC1	I have control over using the system.
	PEC2	I have the resources necessary to use the system.
	PEC3	Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system.
	PEC4	The system is not compatible with other systems I use.
Computer Playfulness (CPLAY)		The following questions ask you how you would characterize yourself when you use computers:
	CPLAY1	. . . spontaneous
	CPLAY2	. . . creative
	CPLAY3	. . . playful
	CPLAY4	. . . unoriginal
Computer Anxiety (CANX)	CANX1	Computers do not scare me at all.
	CANX2	Working with a computer makes me nervous.
	CANX3	Computers make me feel uncomfortable.
	CANX4	Computers make me feel uneasy.
Perceived Enjoyment (ENJ)	ENJ1	I find using the system to be enjoyable.
	ENJ2	The actual process of using the system is pleasant.
	ENJ3	I have fun using the system.
Objective Usability (OU)		No specific items were used. It was measured as a ratio of time spent by the subject to the time spent by an expert on the same set of tasks.
Subjective Norm (SN)	SN1	People who influence my behavior think that I should use the system.
	SN2	People who are important to me think that I should use the system.
	SN3	The senior management of this business has been helpful in the use of the system.
	SN4	In general, the organization has supported the use of the system.
Voluntariness (VOL)	VOL1	My use of the system is voluntary.
	VOL2	My supervisor does not require me to use the system.
	VOL3	Although it might be helpful, using the system is certainly not compulsory in my job.
Image (IMG)	IMG1	People in my organization who use the system have more prestige than those who do not.
	IMG2	People in my organization who use the system have a high profile.
	IMG3	Having the system is a status symbol in my organization.
Job Relevance (REL)	REL1	In my job, usage of the system is important.
	REL2	In my job, usage of the system is relevant.
	REL3	The use of the system is pertinent to my various job-related tasks.
Output Quality (OUT)	OUT1	The quality of the output I get from the system is high.
	OUT2	I have no problem with the quality of the system's output.
	OUT3	I rate the results from the system to be excellent.
Result Demonstrability (RES)	RES1	I have no difficulty telling others about the results of using the system.
	RES2	I believe I could communicate to others the consequences of using the system.
	RES3	The results of using the system are apparent to me.
	RES4	I would have difficulty explaining why using the system may or may not be beneficial.
Behavioral Intention (BI)	BI1	Assuming I had access to the system, I intend to use it.
	BI2	Given that I had access to the system, I predict that I would use it.
	BI3	I plan to use the system in the next <n> months.
Use Behaviour (USE)	USE1	On average, how much time do you spend on the system each day?

[a] All items were measured on a 7-point Likert scale (where 1: *strongly disagree*; 2: *moderately disagree*, 3: *somewhat disagree*, 4: *neutral* (neither disagree nor agree), 5: *somewhat agree*, 6: *moderately agree*, and 7: *strongly agree*), except computer self-efficacy, which was measured using a 10-point Guttman scale.

Appendix D

	Teachers' Questionnaire:							
	The First Part: Please rate YOUR AGREEMENT with the following statements <u>RELATED TO THE NOOR SYSTEM</u> on a scale of 1 to 7, where: 1 = "Strongly Disagree", 2 = "Moderately Disagree", 3 = "Somewhat Disagree", 4 = "Neutral (neither disagree nor agree)", 5 = "Somewhat Agree", 6 = "Moderately Agree", and 7 = "Strongly Agree":	**Strongly Disagree**	**Moderately Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Moderately Agree**	**Strongly Agree**
		1	**2**	**3**	**4**	**5**	**6**	**7**
	<u>Example: *it is important to learn how to use a computer*</u>	○	○	○	○	○	○	●
1.	Improves my job performance.	○	○	○	○	○	○	○
2.	Increases my productivity in my job.	○	○	○	○	○	○	○
3.	Enhances my effectiveness in my job.	○	○	○	○	○	○	○
4.	Useful in my job.	○	○	○	○	○	○	○
5.	Improve the quality of my job.	○	○	○	○	○	○	○
6.	Enables me to accomplish tasks more quickly	○	○	○	○	○	○	○
7.	My interaction with the Noor system is clear and understandable.	○	○	○	○	○	○	○
8.	Interacting with the Noor system does not require a lot of my mental effort.	○	○	○	○	○	○	○
9.	I find the Noor system to be easy to use.	○	○	○	○	○	○	○
10.	I find it easy to get Noor system to do what I want it to do.	○	○	○	○	○	○	○
11.	Using the Noor System could give me greater control over my job tasks.	○	○	○	○	○	○	○
12.	I have the resources necessary to use the Noor system.	○	○	○	○	○	○	○
13.	Given the resources, opportunities and knowledge it takes to use the Noor system, it would be easy for me to use the Noor system.	○	○	○	○	○	○	○
14.	The Noor system is not compatible with other systems I use.	○	○	○	○	○	○	○
15.	Using the Noor system is compatible with how I like to conduct my job tasks.	○	○	○	○	○	○	○
16.	Using the Noor system is completely compatible with my current needs.	○	○	○	○	○	○	○
17.	I think that using the Noor system would fit well with the way that I prefer to conduct my job tasks.	○	○	○	○	○	○	○
18.	I find using the Noor system to be enjoyable.	○	○	○	○	○	○	○
19.	The actual process of using the Noor system is pleasant.	○	○	○	○	○	○	○
20.	I have fun using the Noor system.	○	○	○	○	○	○	○
21.	My experience with using the Noor system was better than I expected.	○	○	○	○	○	○	○
22.	The Noor system can meet my demand in accessing what I require.	○	○	○	○	○	○	○
23.	People who influence my behaviour think that I should use the Noor system.	○	○	○	○	○	○	○
24.	People who are important to me think that I should use the Noor system.	○	○	○	○	○	○	○
25.	The school management has been helpful in the use of the Noor system.	○	○	○	○	○	○	○
26.	In general, the Ministry of Education has supported the use of the Noor system.	○	○	○	○	○	○	○
27.	My use of the Noor system is voluntary.	○	○	○	○	○	○	○
28.	My Manager does not require me to use the Noor system.	○	○	○	○	○	○	○
29.	Although it might be helpful, using the Noor system is certainly not compulsory in my job.	○	○	○	○	○	○	○
30.	People in my organisation who use the Noor system have more prestige than those who do not.	○	○	○	○	○	○	○
31.	People in my organisation who use the Noor system have a high profile.	○	○	○	○	○	○	○

		Strongly Disagree	Moderately Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Moderately Agree	Strongly Agree
		1	2	3	4	5	6	7
32.	Having the Noor system is a status symbol in my school.	○	○	○	○	○	○	○
33.	In my job, the usage of the Noor system is important.	○	○	○	○	○	○	○
34.	In my job, usage of the Noor system is relevant.	○	○	○	○	○	○	○
35.	The use of the Noor system is pertinent to my various job-related tasks.	○	○	○	○	○	○	○
36.	The quality of the output that I get from the Noor system is high.	○	○	○	○	○	○	○
37.	I have no problem with the quality of the Noor system's output.	○	○	○	○	○	○	○
38.	I rate the results from the Noor system as excellent.	○	○	○	○	○	○	○
39.	I would have no difficulties in telling others about the results of using the Noor system.	○	○	○	○	○	○	○
40.	I believe I could communicate to others about the consequences of using the Noor system.	○	○	○	○	○	○	○
41.	The results of using the Noor system are apparent to me.	○	○	○	○	○	○	○
42.	I would have difficulties explaining why using the Noor system may or may not be beneficial.	○	○	○	○	○	○	○
43.	I can easily access the Noor system at peak times (such as exam times)	○	○	○	○	○	○	○
44.	I can easily access the Noor system in the evening times.	○	○	○	○	○	○	○
45.	I can easily access the Noor system during working hours.	○	○	○	○	○	○	○
46.	I use the Noor system whenever appropriate to help me do my teaching tasks.	○	○	○	○	○	○	○
47.	Assuming I had access to the Noor system, I intend to use it.	○	○	○	○	○	○	○
48.	Given that I had access to the Noor system, I predict that I would use it.	○	○	○	○	○	○	○
49.	I plan to use the Noor system in the next 6 months.	○	○	○	○	○	○	○
	The following questions ask you how you would characterise yourself when you use computers:							
50.	- Spontaneous	○	○	○	○	○	○	○
51.	- Creative	○	○	○	○	○	○	○
52.	- Playful	○	○	○	○	○	○	○
53.	- Unoriginal	○	○	○	○	○	○	○
54.	Computers do not scare me at all.	○	○	○	○	○	○	○
55.	Working with a computer makes me nervous.	○	○	○	○	○	○	○
56.	Computers make me feel uncomfortable.	○	○	○	○	○	○	○
57.	Computers make me feel uneasy.	○	○	○	○	○	○	○

The Second Part: Please rate YOUR CONFIDENCE with the following statements on a scale of 1 to 10, where: 1 = "not at all confident" to 10 = "totally confident" **I could complete a job using Noor System .**		not at all				Moderately confident					totally confident
		1	2	3	4	5	6	7	8	9	10
58.	. . . if there was no one around to guide me on what to do.	○	○	○	○	○	○	○	○	○	○
59.	… if I had just the built-in help facility for assistance.	○	○	○	○	○	○	○	○	○	○
60.	… if someone showed me how to do it first.	○	○	○	○	○	○	○	○	○	○
61.	… if I had used similar packages before this one to do the same job.	○	○	○	○	○	○	○	○	○	○
62.	I am confident that I can overcome any obstacles when using the Noor System.	○	○	○	○	○	○	○	○	○	○

The Third Part: The Demographic Data:

63. **In which age category do you belong to?**
    - 18 to 25 years
    - 25 to 35 years
    - 35 to 45 years
    - 45 to 55 years
    - Age 55 or older
64. **What is your gender?**
    - Male
    - Female
65. **How many of your children who are under 18 years old are currently attending pre-university formal education (primary/ intermediate /secondary?**
    - None
    - 1-3
    - 4-6
    - 7-9
    - 9 or more
66. **What is the education level of your children (multiple choices)?**
    - Primary
    - Intermediate
    - Secondary
67. **If you have children enrolled in school, do you use the Noor system to monitor their progress?**
    - □ Yes □ No

If your answered "YES" to the previous question then answer the following question or else go to question 69:

68. **How often do you use the Noor system to monitor your children progress?**
    - Daily
    - Two or three times a week
    - Once a week.
    - Two or three times a month
    - Once a month
    - Less than once a month
69. **In which level of schooling do you teach currently? (you can choose more than one)**
    - Primary.
    - Intermediate.
    - Secondary.
70. **How many lessons do you teach per week?**
    - Less than 6.
    - 6-12.
    - 12-18.
    - 18-24.
    - 24 or more.
71. **What is the total number of Students' that you are currently teaching?**
    - Less than 100 Students'.

- 100-200 Students'.
- 200-300 Students'.
- 300-400 Students'.
- 400 Students' or more.

72. Do you engage in other tasks beside teaching Students'?

□ Yes □ No

73. How many years of teaching experience do you have?

- Less than 6 months.
- 6-12 months.
- 1-2 years.
- 2-3 years.
- 3-4 years.
- 4-5 years.
- 5-15 years.
- 15-25 years.
- 25 years or more.

74. What is your total monthly income (in Saudi Riyal)?

- Less than SR3,000
- SR3,000 to SR5,999
- SR6,000 to SR8,999
- SR9,000 to SR11,999
- SR12,000 to SR14,999
- SR15,000 to SR17,999
- SR18,000 or more

75. What is the highest level of education that you have completed?

- Primary school
- Intermediate school
- Secondary School
- Diploma
- Bachelor degree
- Master degree
- PhD or higher
- Other: (please specify)

....

76. In which region of the Saudi Arabia Kingdom is your job located?

- Central region
- West region
- East region
- North region
- South region
- Working in the diaspora

77. Which of the following best describes the area in which your job located?

- City
- Village

78. In which region of the Saudi Arabia Kingdom is your home located?

- Central region
- West region
- East region
- North region

- South region
- Living in the diaspora

79. **Which of the following best describes the area in which your home located?**
    - City
    - Village

80. **How long have you been using the Noor system?**
    - Less than 6 months.
    - 6-12 months.
    - 1-2 years.
    - 2-3 years.
    - 3-4 years.
    - 4 years or more

81. **Have you ever attended any training course, workshop, or seminar on using the Noor system?**

    □Yes □ No

If you answered "YES" to the previous question then answer the following question or go to question 83

82. **Who provided you with the training course?**
    - Private training
    - Training offer by one of the MOE training centres
    - Training offer by one of the MOE schools
    - Other: (please specify)

    ....

83. **Did you receive any support (such as a copy of the user manual) when you registered for your Noor system account?**

    □Yes □ No

84. **Have you ever used any of the Noor system help and support services?**

    □Yes □ No

If you answered "YES" to the previous question then answer the following question or else go to question 86

85. **Choice the help and support options that you used when you face a problem in using Noor system?**
    - The Noor system integrated help and support option.
    - The Noor system help and support offered by official support forums.
    - The Noor system help and support offered by non-official help and support forums.
    - The Search engine (such as Google and Bing).
    - Help from colleague(s) or friend(s).
    - Help from school management.
    - Other: (please specify).

    ....

86. **Do you have Internet access at work?**

    □Yes □ No

87. **Do you have Internet access at home?**

- ☐Yes ☐ No

88. **How long have you been using the Internet?**

- Less than 6 months.
- 6-12 months.
- 1-2 years.
- 2-3 years.
- 3-4 years.
- 4-8 years.
- 8-12 years.
- 12 years or more.

89. **What is your level of Internet Proficiency?**

○ Very low ○ Low ○ Satisfactory ○ Good ○ Very Good

90. **How often do you use the Internet?**

- Daily
- Two or three times a week
- Once a week.
- Two. or three times a month
- Once a month
- Less than once a month

91. **What is your average time for each time you use the Internet?**

- Less than 30 minutes
- 30 minutes – 1 hour
- 1– 2 hours
- 2– 3 hours
- More than 3 hours

92. **Which device (s) do you use to access the Noor system? (You can choose more than one answer).**

- Desktop PC.
- Laptop
- Tablet.
- Smart Phone.
- Other: (please specify)

....

93. **How often do you use the Noor system?**

- Daily
- Two or three times a week
- Once a week.
- Two or three times a month
- Once a month
- Less than once a month

94. **What are the average time for each time you are using Noor system?**

- Less than 30 minutes
- 30 minutes – 1 hour
- 1– 2 hours
- 2– 3 hours
- More than 3 hours

95. **What is your Nationality**

- Saudi
- non-Saudis

Appendix E

Students' Questionnaire:

The First Part: Please rate YOUR AGREEMENT with the following statements <u>RELATED TO THE NOOR SYSTEM</u> on a scale of 1 to 7, where: 1 = "Strongly Disagree", 2 = "Moderately Disagree", 3 = "Somewhat Disagree", 4 = "Neutral (neither disagree nor agree)", 5 = "Somewhat Agree", 6 = "Moderately Agree", and 7 = "Strongly Agree":		Strongly Disagree	Moderately Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Moderately Agree	Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
	Example: *it is important to learn how to use a computer*	○	○	○	○	○	○	●
1.	Using the Noor system improves my performance in following the progress of my studies.	○	○	○	○	○	○	○
2.	Using the Noor system to follow my study's progress, increases my productivity.	○	○	○	○	○	○	○
3.	Using the Noor system enhances my effectiveness in following my study's progress.	○	○	○	○	○	○	○
4.	I find the Noor system to be useful when following the progress of my studies.	○	○	○	○	○	○	○
5.	Using Noor system would improve the quality of following the progress of my studies.	○	○	○	○	○	○	○
6.	The Noor System enables me to follow the progress of my studies more quickly.	○	○	○	○	○	○	○
7.	My interaction with Noor system is clear and understandable.	○	○	○	○	○	○	○
8.	Interacting with the Noor system does not require a lot of my mental effort.	○	○	○	○	○	○	○
9.	I find the Noor system to be easy to use.	○	○	○	○	○	○	○
10.	I find it easy to get the Noor system to do what I want it to do.	○	○	○	○	○	○	○
11.	Using the Noor System could give me greater control to follow the progress of my studies.	○	○	○	○	○	○	○
12.	I have the necessary resources to use the Noor system.	○	○	○	○	○	○	○
13.	Given the resources, opportunities and knowledge it takes to use Noor system, it would be easy for me to use the Noor system.	○	○	○	○	○	○	○
14.	The Noor system is not compatible with other systems that I use.	○	○	○	○	○	○	○
15.	Using Noor system is compatible with how I like to follow my study's progress.	○	○	○	○	○	○	○
16.	Using the Noor system is completely compatible with my current needs.	○	○	○	○	○	○	○
17.	I think that using Noor system would fit well with the way that I prefer in following the progress of my studies.	○	○	○	○	○	○	○
18.	I find using the Noor system enjoyable.	○	○	○	○	○	○	○
19.	The actual process of using the Noor system is pleasant.	○	○	○	○	○	○	○
20.	I have fun using the Noor system.	○	○	○	○	○	○	○
21.	My experience with using the Noor system was better than I had expected.	○	○	○	○	○	○	○
22.	The Noor system can meet the demand of accessing what I require.	○	○	○	○	○	○	○
23.	People who influence my behaviour think that I should use the Noor system.	○	○	○	○	○	○	○
24.	People who are important to me think that I should use the Noor system.	○	○	○	○	○	○	○
25.	The staffs at the school have been helpful in the use of the Noor system.	○	○	○	○	○	○	○
26.	In general, the Ministry of Education has supported the use of the Noor system.	○	○	○	○	○	○	○
27.	My use of the Noor system is voluntary.	○	○	○	○	○	○	○
28.	The school's authority does not require me to use the Noor system.	○	○	○	○	○	○	○
29.	Although it might be helpful, using the Noor system is certainly not compulsory in following the progress of my studies.	○	○	○	○	○	○	○
30.	People in my school who use the Noor system feel more prestigious than those who do not.	○	○	○	○	○	○	○
31.	People in my school who use the Noor system have a high profile.	○	○	○	○	○	○	○
32.	Having the Noor system is a status symbol in my school.	○	○	○	○	○	○	○
33.	In following the progress of my studies, the use of the Noor system is important.	○	○	○	○	○	○	○
34.	In following the progress of my studies, the use of the Noor system is relevant.	○	○	○	○	○	○	○

			Strongly Disagree	Moderately Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Moderately Agree	Strongly Agree
			1	**2**	**3**	**4**	**5**	**6**	**7**
	35.	The use of Noor system is pertinent to my various study-related needs.	○	○	○	○	○	○	○
	36.	The quality of the output I get from the Noor system is high.	○	○	○	○	○	○	○
	37.	I have no problem with the quality of the Noor system's output.	○	○	○	○	○	○	○
	38.	I rate the results from the Noor system to be excellent.	○	○	○	○	○	○	○
	39.	I would have no difficulties in telling others about the results of using the Noor system.	○	○	○	○	○	○	○
	40.	I believe I could communicate to others the consequences of using the Noor system.	○	○	○	○	○	○	○
	41.	The results of using the Noor system are apparent to me.	○	○	○	○	○	○	○
	42.	I would have difficulties in explaining why using the Noor system may or may not be beneficial.	○	○	○	○	○	○	○
	43.	I can easily access the Noor system at peak times (such as exam times)	○	○	○	○	○	○	○
	44.	I can easily access the Noor system in the evening times.	○	○	○	○	○	○	○
	45.	I can easily access the Noor system during working hours.	○	○	○	○	○	○	○
	46.	I use the Noor system whenever appropriate to help me in following the progress of my studies.	○	○	○	○	○	○	○
	47.	Assuming I had access to the Noor system, I intend to use it.	○	○	○	○	○	○	○
	48.	Given that I had access to the Noor system, I predict that I would use it.	○	○	○	○	○	○	○
	49.	I plan to use the Noor system in the next 6 months.	○	○	○	○	○	○	○
		The following questions ask you how you would characterise yourself when you use computers:							
	50.	- Spontaneous	○	○	○	○	○	○	○
	51.	- Creative	○	○	○	○	○	○	○
	52.	- Playful	○	○	○	○	○	○	○
	53.	- Unoriginal	○	○	○	○	○	○	○
	54.	Computers do not scare me at all.	○	○	○	○	○	○	○
	55.	Working with a computer makes me nervous.	○	○	○	○	○	○	○
	56.	Computers make me feel uncomfortable.	○	○	○	○	○	○	○
	57.	Computers make me feel uneasy.	○	○	○	○	○	○	○

The Second Part: Please rate YOUR CONFIDENCE with the following statements on a scale of 1 to 10, where: 1 = "not at all confident" to 10 = "totally confident" **I could complete a job using Noor System.**		not at all confident				Moderately confident					totally confident
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	58.	. . . if there was no one around to guide me on what to do.	○	○	○	○	○	○	○	○	○	○
	59.	… if I had just the built-in help facility for assistance.	○	○	○	○	○	○	○	○	○	○
	60.	… if someone showed me how to do it first.	○	○	○	○	○	○	○	○	○	○
	61.	… if I had used similar packages before this one to do the same job.	○	○	○	○	○	○	○	○	○	○
	62.	I am confident that I can overcome any obstacles when using the Noor System.	○	○	○	○	○	○	○	○	○	○

The Third Part: The Demographic Data:

63. **In which age category do you belong to?**
    - Under 15 years
    - 15 to 16 years
    - 16 to 17 years
    - 17 to 18 years
    - Age 18 or older
64. **What is your gender?**
    - Male
    - Female
65. **Which is your class level?**
    - First year.
    - Second year.
    - Third year.
66. **What do you major in?**
    - Science.
    - Art.
    - Other: (please specify)

    ....

67. **In which region of the Saudi Arabia Kingdom is your home located?**
    - Central region
    - West region
    - East region
    - North region
    - South region
    - Living in the diaspora
68. **Which of the following best describes the area in which your home is located?**
    - City
    - Village
69. **How long have you been using the Noor system?**
    - Less than 6 months.
    - 6-12 months.
    - 1-2 years.
    - 2-3 years.
    - 3-4 years.
    - 4 years or more
70. **Have you ever attended any training course, workshop, or seminar on using the Noor system?**

    □Yes □ No

If you answered "YES" to the previous question then answer the following question or go to question 72

71. **Who provided you with the training course?**
    - Private training.
    - Training offer by one of the MOE training centres.
    - Training offer by one of the MOE schools.
    - Other: (please specify)

    ....

72. **Did you receive any support (such as a copy of the user manual) when you registered for your Noor system account?**

□Yes □ No

73. **Have you ever used any of the Noor system help and support services?**

□Yes □ No

If you answered “YES” to the previous question then answer the following question or else go to question 75

74. **Choose the help and support options that you used when you face a problem in using the Noor system?**
    - The Noor system integrated help and support option.
    - The Noor system help and support offered by the official support forums.
    - The Noor system help and support offered by non-official help and support forums.
    - The Search engine (such as Google and Bing).
    - Help from colleague (s) or friend (s).
    - Help from school management.
    - Other: (please specify).

....

75. **Do you have Internet access at home?**
    - □Yes □ No
76. **How long have you been using the Internet?**
    - Less than 6 months.
    - 6-12 months.
    - 1-2 years.
    - 2-3 years.
    - 3-4 years.
    - 4-8 years.
    - 8-12 years.
    - 12 years or more.
77. **What is your level of Internet Proficiency?**

○ Very low ○ Low ○ Satisfactory ○ Good ○ Very Good

78. **How often do you use the Internet?**
    - Daily
    - Two or three times a week
    - Once a week.
    - Two or three times a month
    - Once a month
    - Less than once a month
79. **What is your average time for each time you use the Internet?**
    - Less than 30 minutes
    - 30 minutes – 1 hour
    - 1– 2 hours
    - 2– 3 hours
    - More than 3 hours
80. **Which device (s) do you use to access the Noor system? (You can choose more than one answer).**
    - Desktop PC.

- Laptop
- Tablet.
- Smart Phone.
- Other: (please specify)

....

81. How often do you use the Noor system?

- Daily
- Two or three times a week
- Once a week.
- Two or three times a month
- Once a month
- Less than once a month

82. What is your average time for each time you use the Noor system?

- Less than 30 minutes
- 30 minutes – 1 hour
- 1– 2 hours
- 2– 3 hours
- More than 3 hours

83. What is your Nationality?

- Saudi
- non-Saudis

Appendix F

Parents' Questionnaire:									
		The First Part: Please rate YOUR AGREEMENT with the following statements <u>RELATED TO THE NOOR SYSTEM</u> on a scale of 1 to 7, where: 1 = "Strongly Disagree", 2 = "Moderately Disagree", 3 = "Somewhat Disagree", 4 = "Neutral (neither disagree nor agree)", 5 = "Somewhat Agree", 6 = "Moderately Agree", and 7 = "Strongly Agree":	**Strongly Disagree**	**Moderately Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Moderately Agree**	**Strongly Agree**
			1	**2**	**3**	**4**	**5**	**6**	**7**
		<u>Example: *it is important to learn how to use a computer*</u>	○	○	○	○	○	○	●
	1.	Using the Noor system improves my performance in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	2.	Using the Noor system increases my productivity in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	3.	Using the Noor system enhances my effectiveness in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	4.	I find the Noor system to be useful in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	5.	Using the Noor system would improve the quality of keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	6.	The Noor System enables me to keep an eye on the study progress of my son/daughter more quickly.	○	○	○	○	○	○	○
	7.	My interaction with the Noor system is clear and understandable.	○	○	○	○	○	○	○
	8.	Interacting with the Noor system does not require a lot of my mental effort.	○	○	○	○	○	○	○
	9.	I find the Noor system to be easy to use.	○	○	○	○	○	○	○
	10.	I find it easy to get the Noor system to do what I want it to do.	○	○	○	○	○	○	○
	11.	Using the Noor System could give me greater control over keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	12.	I have the necessary resources to use the Noor system.	○	○	○	○	○	○	○
	13.	Given the resources, opportunities and knowledge it takes to use Noor system, it would be easy for me to use the Noor system.	○	○	○	○	○	○	○
	14.	Noor system is not compatible with other systems that I use.	○	○	○	○	○	○	○
	15.	Using Noor system is compatible with how I like to keep an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	16.	Using the Noor system is completely compatible with my current needs.	○	○	○	○	○	○	○
	17.	I think that using Noor system would fit well with the way that I prefer in keeping an eye on the study progress of my son/daughter study status.	○	○	○	○	○	○	○
	18.	I find using the Noor system enjoyable.	○	○	○	○	○	○	○
	19.	The actual process of using the Noor system is pleasant.	○	○	○	○	○	○	○
	20.	I have fun using the Noor system.	○	○	○	○	○	○	○
	21.	My experience with using the Noor system was better than I had expected.	○	○	○	○	○	○	○
	22.	The Noor system can meet the demand of accessing what I require.	○	○	○	○	○	○	○
	23.	People who influence my behaviour think that I should use the Noor system.	○	○	○	○	○	○	○
	24.	People who are important to me think that I should use the Noor system.	○	○	○	○	○	○	○
	25.	The school management has been helpful in the use of the Noor system.	○	○	○	○	○	○	○
	26.	In general, the Ministry of Education has supported the use of Noor system.	○	○	○	○	○	○	○
	27.	My use of the Noor system is voluntary.	○	○	○	○	○	○	○
	28.	The school's authority does not require me to use the Noor system.	○	○	○	○	○	○	○

			Strongly Disagree	Moderately Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Moderately Agree	Strongly Agree
			1	2	3	4	5	6	7
	29.	Although it might be helpful, using Noor system is certainly not compulsory in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	30.	People in my society who use the Noor system feel more prestigious than those who do not.	○	○	○	○	○	○	○
	31.	People in my society who use the Noor system have a high profile.	○	○	○	○	○	○	○
	32.	Having the Noor system is a status symbol in my society.	○	○	○	○	○	○	○
	33.	The use of the Noor system is important in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	34.	The use of the Noor system is relevant in keeping an eye the study progress of my son/daughter.	○	○	○	○	○	○	○
	35.	The use of Noor system is pertinent to my keeping an eye on the related needs in the study progress of my son/daughter.	○	○	○	○	○	○	○
	36.	The quality of the output I get from the Noor system is high.	○	○	○	○	○	○	○
	37.	I have no problem with the quality of the Noor system's output.	○	○	○	○	○	○	○
	38.	I rate the results from the Noor system to be excellent.	○	○	○	○	○	○	○
	39.	I would have no difficulties in telling others about the results of using the Noor system.	○	○	○	○	○	○	○
	40.	I believe I could communicate to others the consequences of using the Noor system.	○	○	○	○	○	○	○
	41.	The results of using the Noor system are apparent to me.	○	○	○	○	○	○	○
	42.	I would have difficulties in explaining why using the Noor system may or may not be beneficial.	○	○	○	○	○	○	○
	43.	I can easily access the Noor system at peak times (such as exam times)	○	○	○	○	○	○	○
	44.	I can easily access the Noor system in the evening times.	○	○	○	○	○	○	○
	45.	I can easily access the Noor system during working hours.	○	○	○	○	○	○	○
	46.	I use the Noor system whenever appropriate to help me in keeping an eye on the study progress of my son/daughter.	○	○	○	○	○	○	○
	47.	Assuming I had access to the Noor system, I intend to use it.	○	○	○	○	○	○	○
	48.	Given that I had access to the Noor system, I predict that I would use it.	○	○	○	○	○	○	○
	49.	I plan to use the Noor system in the next 6 months.	○	○	○	○	○	○	○
		The following questions ask you how you would characterise yourself when you use computers:							
	50.	- Spontaneous	○	○	○	○	○	○	○
	51.	- Creative	○	○	○	○	○	○	○
	52.	- Playful	○	○	○	○	○	○	○
	53.	- Unoriginal	○	○	○	○	○	○	○
	54.	Computers do not scare me at all.	○	○	○	○	○	○	○
	55.	Working with a computer makes me nervous.	○	○	○	○	○	○	○
	56.	Computers make me feel uncomfortable.	○	○	○	○	○	○	○
	57.	Computers make me feel uneasy.	○	○	○	○	○	○	○

The Second Part: Please rate YOUR CONFIDENCE with the following statements on a scale of 1 to 10, where: 1 = "not at all confident" to 10 = "totally confident" I could complete a job using Noor System .			not at all confident				Moderately confident					totally confident
			1	2	3	4	5	6	7	8	9	10
	58.	. . . if there was no one around to guide me on what to do.	○	○	○	○	○	○	○	○	○	○

	59.	… if I had just the built-in help facility for assistance.	○	○	○	○	○	○	○	○	○	○
	60.	… if someone showed me how to do it first.	○	○	○	○	○	○	○	○	○	○
	61.	… if I had used similar packages before this one to do the same job.	○	○	○	○	○	○	○	○	○	○
	62.	I am confident that I can overcome any obstacles when using the Noor	○	○	○	○	○	○	○	○	○	○

The Third Part: The Demographic Data:

63. **In which age category do you belong to?**
    - 18 to 25 years
    - 25 to 35 years
    - 35 to 45 years
    - 45 to 55 years
    - Age 55 or older
64. **What is your gender?**
    - Male
    - Female
65. **In which region of the Saudi Arabia Kingdom is your home located?**
    - Central region
    - West region
    - East region
    - North region
    - South region
    - Living in the diaspora
66. **Which of the following best describes the area in which your home is located?**
    - City
    - Village
67. **How many of your children who are under 18 years old are currently attending pre-university formal education (primary/ intermediate /secondary?**
    - 1-3
    - 4-6
    - 7-9
    - 9 or more

68. **What is the education level of your children (multiple choices)?**
    - Primary
    - Intermediate
    - Secondary
69. **If you have children enrolled in school, do you use the Noor system to monitor your children progress?**
    - □ Yes □ No

If you answered “YES” to the previous question then answer the following question or else go to question 70:

70. **How often do you use the Noor system to monitor your children progress?**
    - Daily
    - Two or three times a week
    - Once a week.
    - Two or three times a month
    - Once a month
    - Less than once a month

71. **In which category do you belong to?**
- □ Not employed.
- □ Students'.
- □ Government sector employee.
- □ Private sector employee.
- □ Freelancer.
- □ Retired.
- □ Other: (please specify)

....

If you answer is "Not employed", or "Students'" to the previous question then go to question 76:

72. **Are you using the Noor system in your job?**

□ Yes □ No

73. **How many years of experience do you have in your current job?**
- o Less than 6 months.
- o 6-12 months.
- o 1-2 years.
- o 2-3 years.
- o 3-4 years.
- o 4-5 years.
- o 5-15 years.
- o 15-25 years.
- o 25 years or more.

74. **What is your total monthly income (in Saudi Riyal)?**
- o Less than SR3,000
- o SR3,000 to SR5,999
- o SR6,000 to SR8,999
- o SR9,000 to SR11,999
- o SR12,000 to SR14,999
- o SR15,000 to SR17,999
- o SR18,000 or more

75. **In which region of the Saudi Arabia Kingdom is your job located?**
- o Central region
- o West region
- o East region
- o North region
- o South region
- o Working in the diaspora

76. **Which of the following best describes the area in which your job is located?**
- o City
- o Village

77. **Do you have Internet access at work?**

□Yes □ No

78. **Have you ever attended any training course, workshop, or seminar on using the Noor system?**

□Yes □ No

If you answered “YES” to the previous question then answer the following question or else go to question 80

79. Who provided you with the training course?

- Private training
- Training offer by one of the MOE training centres
- Training offer by one of the MOE schools
- Other: (please specify)
  ....

80. Have you ever used any of the Noor system help and support services?

□Yes □ No

If you answered “YES” to the previous question then answer the following question or else go to question 82

81. Choose the help and support options that you used when you face a problem in using the Noor system?

- The Noor system integrated help and support option.
- The Noor system help and support offered by official support forums.
- The Noor system help and support offered by non-official help and support forums.
- The search engine (such as Google and Bing).
- The help from colleague (s) or friend (s).
- The help from the school management.
- Other: (please specify).
- ....

82. Did you receive any support (such as a copy of the user manual) when you registered for your Noor system account?

□Yes □ No

83. What is the highest level of education that you have completed?

- No formal education
- Primary school
- Intermediate school
- Secondary School
- Diploma
- Bachelor degree
- Master degree
- PhD or higher
- Other: (please specify)
- ....

84. How long have you been using the Noor system?

- Less than 6 months.
- 6-12 months.
- 1-2 years.
- 2-3 years.
- 3-4 years.
- 4 years or more

85. Do you have Internet access at home?

- □Yes □ No

86. How long have you been using the Internet?

- Less than 6 months.
- 6-12 months.
- 1-2 years.
- 2-3 years.
- 3-4 years.
- 4-8 years.
- 8-12 years.
- 12 years or more.

87. What is your level of Internet Proficiency?

○ Very low ○ Low ○ Satisfactory ○ Good ○ Very Good ○ Excellent

88. How often do you use the Internet?

- Daily
- Two or three times a week
- Once a week.
- Two or three times a month
- Once a month
- Less than once a month

89. What is your average time for each time you use the Internet?

- Less than 30 minutes
- 30 minutes – 1 hour
- 1– 2 hours
- 2– 3 hours
- More than 3 hours

90. Which device (s) do you use to access the Noor system? (You can choose more than one answer).

- Desktop PC.
- Laptop
- Tablet.
- Smart Phone.
- Other: (please specify)
- ....

91. How often do you use the Noor system?

- Daily
- Two or three times a week
- Once a week.
- Two or three times a month
- Once a month
- Less than once a month

92. What is your average time for each time you use the Noor system?

- Less than 30 minutes
- 30 minutes – 1 hour
- 1– 2 hours
- 2– 3 hours
- More than 3 hours

93. What is your Nationality

- Saudi
- non-Saudis

Appendix G

TAM 3 items frequencies and summary statistics

Table 11.51: Questionnaire Summary Statistics; 10 Guttmann Scale

% Percent	Not at all confident	2	3	4	Moderately confident	6	7	8	9	Totally confident
V58 Teachers’	6.4	1.3	1.0	1.2	23.0	2.6	4.6	9.1	5.9	44.9
V58 Students’	8.2	1.3	1.9	2.5	28.4	4.3	5.8	7.9	4.3	35.4
V58 Parents’	5.5	0.7	1.4	1.2	24.7	4.6	4.8	8.1	5.6	43.3
V59 Teachers’	7.4	1.1	1.7	1.5	22.6	3.6	5.1	8.9	7.3	40.7
V59 Students’	9.3	1.8	2.7	2.7	26.0	4.4	6.5	6.7	5.1	34.9
V59 Parents’	5.9	1.1	1.3	1.3	25.0	4.8	5.4	8.2	6.7	40.4
V60 Teachers’	5.6	0.5	1.0	1.4	15.8	3.2	4.6	7.9	8.3	51.7
V60 Students’	6.3	0.8	1.6	1.8	20.3	4.2	5.5	7.3	6.5	45.7
V60 Parents’	5.0	0.7	1.1	1.4	20.7	4.4	4.7	8.0	7.3	46.7
V61 Teachers’	10.5	1.9	1.8	2.6	25.3	4.2	4.8	9.5	6.6	32.8
V61 Students’	16.6	2.4	3.4	4.1	25.3	4.2	5.2	6.4	5.9	26.5
V61 Parents’	11.9	1.6	2.0	2.7	27.0	5.0	5.5	7.8	5.8	30.8
V62 Teachers’	6.2	0.8	2.0	2.5	19.2	4.3	6.3	10.3	8.6	39.7
V62 Students’	8.3	2.0	2.4	3.4	23.9	4.2	6.7	8.0	5.9	35.2
V62 Parents’	5.3	1.3	1.9	2.0	22.6	4.2	6.0	9.4	7.7	39.7

Table 11.52: Questionnaire 6 Point Likert scale

	Daily	2-3/ week	Once/week	2-3/month	Once/month	Less than once/m
RV97 Teachers'	46.9	21.8	5.3	10.9	7.3	7.8
RV97 Students'	26.5	15.2	8.4	12.6	10.4	26.8
RV97 Parents'	24.5	18.2	12	15.7	11.8	17.8

Table 11.53: Questionnaire 5 Point Likert scale

	<30 min	30-1hr	1-2hrs	2-3hrs	>3hrs
V98 Teachers'	35.8	24.0	7.1	23.9	9.2
V98 Students'	18.6	13.4	18.3	26.3	23.4
V98 Parents'	17.1	16.7	14.4	33	18.8

Table 11.54: Questionnaire Summary Statistics; 7 Point Likert Scale

% Percent	Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly Agree
V01 Teachers’	16.2	6.1	7.5	5.9	17.8	15.5	31.1
V01 Students’	12.7	5.8	6.2	10	18.6	17.6	29.1
V01 Parents’	10.3	3.5	4.6	6.1	18.5	18.5	38.5
V02 Teachers’	25.1	5.3	7.9	5.1	15.3	13.2	28.1
V02 Students’	15.9	5.8	7.7	12.5	17.7	15.1	25.2
V02 Parents’	10.5	3.6	5.5	7.9	19.4	17.4	35.7
V03 Teachers’	19.7	6.5	9.7	8.7	17	15.5	22.9
V03 Students’	15.5	5.9	7.4	12.7	17.6	14.5	26.4
V03 Parents’	10.3	3.7	5.2	7.8	18.9	17.4	36.8
V04 Teachers’	13.9	5.1	4.9	7.8	20.5	14.9	32.9
V04 Students’	13.1	4.4	5.9	9.4	16.6	15.4	35.2
V04 Parents’	10.5	3.6	5	6.3	16.9	15.8	41.9
V05 Teachers’	15.8	5.4	6.8	9.1	18.5	14.6	29.8
V05 Students’	14.4	5.3	6.8	11.6	16.4	15.3	30.3
V05 Parents’	11.1	3.5	5.6	7.6	17.4	17.2	37.6
V06 Teachers’	22.4	5.9	8.1	7.4	16.3	12.3	27.6
V06 Students’	14.7	5.4	5.7	11	15.4	15.2	32.6
V06 Parents’	11	4	5.4	7.7	17.2	16.1	38.7
V07 Teachers’	12	4.7	6.8	6.2	17.2	16.7	36.4
V07 Students’	10.9	3.8	5.1	7.1	14.3	16.7	42
V07 Parents’	9.2	3.9	5	6.1	17.7	17.6	40.5
V08 Teachers’	16.4	6.2	7.6	4.8	14.9	16.9	33.2
V08 Students’	9	3.6	4.1	7.3	14.2	17	44.7
V08 Parents’	8.8	4	4.7	6.2	15.5	18.9	41.9
V09 Teachers’	19.2	6.4	7.2	4.7	14.3	16.4	31.8
V09 Students’	10.9	3.9	5.8	6.2	13.4	16.9	42.9
V09 Parents’	9.7	4	5.7	5.5	15.5	18.3	41.3
V10 Teachers’	19.4	6.6	10.2	6.1	16	15.8	25.8
V10 Students’	10.7	4.6	6.6	8.4	16.6	18.3	34.8
V10 Parents’	10.5	4	6.8	7.6	18	18.5	34.6
V11 Teachers’	17.5	5.8	8.4	8.9	19.5	16	24
V11 Students’	12.4	4.8	6.7	11.8	17.2	16.9	30.2
V11 Parents’	10.2	3.8	5.8	8.6	18.1	17.4	36
V12 Teachers’	20.5	6.8	9	10.7	18.8	15	19.2
V12 Students’	12.8	4.2	6.1	14.8	14.8	15.9	31.3

V12 Parents'	10.4	3.7	6.7	11.8	17.2	19	31.2
V13 Teachers'	12	5.4	6.5	9.7	18.8	15.8	31.7
V13 Students'	8.6	3.1	4.5	10.5	17.2	16.3	39.8
V13 Parents'	7.3	2.6	4.5	7.9	18.6	18.5	40.6
RV14 Teachers'	11.7	8.4	16	20.5	13.4	10.5	19.5
RV14 Students'	15.7	10.8	15.7	21.2	10.5	7	19.1
RV14 Parents'	13.7	10.7	14.5	19.7	12.5	8.7	20.1
V15 Teachers'	17.3	6.5	10.1	11	20.3	16.1	18.7
V15 Students'	12	5.5	7.4	15.6	17.5	15.5	26.5
V15 Parents'	10.3	3.8	7	12.4	20.6	17.4	28.5
V15 Teachers'	17.3	6.5	10.1	11	20.3	16.1	18.7
V15 Students'	12	5.5	7.4	15.6	17.5	15.5	26.5
V15 Parents'	10.3	3.8	7	12.4	20.6	17.4	28.5
V16 Teachers'	18.1	7.6	11.7	9.7	19.6	14.4	19
V16 Students'	13.1	5	7.6	12.2	18.5	15.2	28.4
V16 Parents'	11.5	4.4	8.1	10.9	20.5	17.3	27.3
V17 Teachers'	17.5	6.8	10.8	12.7	18.4	15.3	18.5
V17 Students'	13.9	5.5	7.3	14.6	17.2	14	27.5
V17 Parents'	10	4.8	6.9	11.8	20.2	17.4	28.9
V18 Teachers'	28.3	6.3	9	11	16.1	12	17.2
V18 Students'	19.5	5.4	8.6	13.4	15.4	12.9	24.8
V18 Parents'	13.4	4.6	6.9	14	18.5	15.3	27.4
V19 Teachers'	26	5.7	12.9	12.5	15.2	12.3	15.5
V19 Students'	18	5.7	8.5	16.6	17	12.8	21.5
V19 Parents'	12	4.6	7.9	14.5	20.5	16.1	24.4
V20 Teachers'	29.9	6.5	11.6	11.7	15.4	10.7	14.2
V20 Students'	21.8	7	9.1	16.1	13.8	12.2	20
V20 Parents'	14.1	4.9	8.3	16.6	19.1	14.1	22.9
V21 Teachers'	24.5	7	11.1	10.5	16.3	12.8	17.8
V21 Students'	17.1	7	8.6	12.9	17.4	13.6	23.5
V21 Parents'	13.2	5.5	9.4	12.8	20.1	14.4	24.6
V22 Teachers'	18.2	8.8	12.1	9.2	21.3	13	17.4
V22 Students'	13.9	6.7	8.6	10.1	19.1	14.9	26.7
V22 Parents'	13.9	6.2	9.4	10.5	22	15	23
V23 Teachers'	18.5	6.3	10	19	18.5	11.8	15.8
V23 Students'	17.3	5	7.7	17.8	16	12.5	23.7
V23 Parents'	12.1	4.9	8.4	20.7	19.3	13.3	21.3

V24 Teachers'	19.3	5.4	10	19.2	18.6	11.2	16.4
V24 Students'	17.2	5.1	6.8	16.9	16.1	12.8	25.2
V24 Parents'	11.5	4.9	7.1	20.5	19.2	13.6	23.1
V25 Teachers'	17.5	4.4	7.6	10.4	20.5	14.1	25.5
V25 Students'	21.5	6.2	7.2	10.7	16	12.4	25.9
V25 Parents'	25	6.1	9.3	15.8	15.1	8.8	19.8
V26 Teachers'	10.2	4.5	4.9	12.4	17.7	14	36.3
V26 Students'	11	3.8	4.3	12.3	16.1	14.2	38.3
V26 Parents'	9.7	4	4.9	15.9	17.1	14.1	34.3
V27 Teachers'	48.1	7.4	10.8	8.9	9.6	5.7	9.5
V27 Students'	14.9	4.7	5.5	12.5	16.6	13.8	31.9
V27 Parents'	11.4	4.2	6.8	14	21.4	14.5	27.7
V28 Teachers'	63.1	6.9	7.4	6.9	5.3	3.7	6.6
V28 Students'	23.4	6.5	8	13.4	13.4	10.5	24.7
V28 Parents'	16.9	5.5	8.5	15	16.3	12	25.9
V29 Teachers'	56.4	7.1	8.6	7.9	6.3	4.2	9.5
V29 Students'	15.5	5.2	6.4	14.6	17.1	12.8	28.5
V29 Parents'	15.6	5.1	8.2	15.4	19.4	12.3	24
V30 Teachers'	38.8	6.2	9.7	18.7	9.5	4.8	12.3
V30 Students'	31.1	4.7	7.4	20.1	11.5	7.7	17.6
V30 Parents'	20.8	4.1	9.2	26	13.1	8.9	18
V31 Teachers'	37.9	7.3	10	17.9	9.8	6.2	10.9
V31 Students'	34.4	6	8.6	19	10.5	7.3	14.2
V31 Parents'	25.2	5.6	10.8	24.5	12.1	7.5	14.3
V32 Teachers'	29.9	5.6	9.4	14.3	14.9	8.6	17.4
V32 Students'	28	6.4	7.8	14.7	12.8	9.7	20.5
V32 Parents'	19.6	4.8	8.5	17.4	15.6	10.5	23.5
V33 Teachers'	14	2.8	4.6	8	18.6	12.1	39.8
V33 Students'	18.2	5.3	6.3	12	15.8	13.3	29.1
V33 Parents'	9.9	3.4	5	8.5	20.2	14.8	38.3
V34 Teachers'	10	2.7	3.6	7.5	19.8	13.6	42.8
V34 Students'	16.4	4.5	5.6	12.9	17.5	14.2	28.9
V34 Parents'	9.6	3.6	5.1	8.9	20.9	15	36.8
V35 Teachers'	12	3.7	6	10.3	21.1	14.6	32.3
V35 Students'	16.7	5	6.7	13.6	18.1	12.2	27.6
V35 Parents'	10.3	3.7	6	11.3	20.2	14.7	33.9
V36 Teachers'	15.3	5.1	6.9	8.5	18.9	14	31.3
V36 Students'	16.8	5.5	7.9	17.1	16.1	13.6	23.1

V36 Parents’	15	5	8.8	14.2	20.4	14.6	22
V37 Teachers’	18.1	7.8	9.4	13.8	17.7	13.8	19.3
V37 Students’	16.9	6.2	8.7	18.6	16	11.1	22.5
V37 Parents’	14.8	5.6	9.8	16.3	19.3	14.2	19.9
V38 Teachers’	15.4	6.7	9.8	12.9	20.4	14.4	20.4
V38 Students’	12.9	5.8	7.9	15.4	18.1	14.1	25.8
V38 Parents’	12.7	5.1	8.8	14.3	20.8	15.7	22.6
V39 Teachers’	12.6	4.5	7.8	16.9	21.1	15.8	21.3
V39 Students’	12.7	3.9	5.3	14.6	16.9	14.6	32
V39 Parents’	9.4	3.5	5.9	18.6	22	15.6	24.9
V40 Teachers’	11.2	3.7	7.4	15.8	22.5	15.9	23.4
V40 Students’	12.2	4.3	5.3	14.7	18.8	13.5	31.3
V40 Parents’	8.7	2.9	5.5	16.8	22	16.1	28
V41 Teachers’	10.3	3.8	5.7	11.8	22.6	15.4	30.3
V41 Students’	11.5	3.2	5.3	13.5	18.6	14.1	33.8
V41 Parents’	9	3.2	6.4	11	20.6	17.3	32.5
RV42 Teachers’	10	10.2	17.9	21.5	12.6	8.9	18.9
RV42 Students’	17.7	11.3	16.8	22	8.8	6.4	17
RV42 Parents’	13.9	11	18.6	21.9	12.7	6.9	15
V43 Teachers’	18.6	9.2	8.2	12.7	13.5	9.1	28.7
V43 Students’	16.7	10.3	9.4	13.2	13.9	8.8	27.9
V43 Parents’	15.3	10.8	9.1	13.6	14.8	9.2	27.1
V44 Teachers’	18.8	6.4	8.3	14.3	14.9	9.8	27.5
V44 Students’	14.5	7.4	12	15.2	13.6	9.8	27.4
V44 Parents’	11.9	7.5	12	14.7	13.8	10.9	29.2
V45 Teachers’	20.6	9.9	10.0	15.5	10.2	7.1	26.8
V45 Students’	17.9	12.1	10.9	13.9	9.2	8.2	27.8
V45 Parents’	15.5	13.7	10.8	14.6	8.7	9.1	27.6
V46 Teachers’	15.5	6.5	8.5	6.9	20.2	18.9	23.6
V46 Students’	15.2	5.1	6.2	14.5	15.6	14.6	28.8
V46 Parents’	11.2	4.7	6.3	13.8	21.5	18	24.5
V47 Teachers’	11.5	3.3	5.5	14.2	18.1	13.2	34.3
V47 Students’	9.9	3.5	4.5	14.8	16.4	13.3	37.5
V47 Parents’	5.4	1.6	3	13.3	19.9	16.5	40.4
V48 Teachers’	9.6	3	4.6	13.4	21.6	16.3	31.6
V48 Students’	9.7	3.2	4	14.2	18.5	14.6	35.6
V48 Parents’	4.8	1.5	2.5	11.5	22	18.7	39

V49 Teachers’	10.5	2.9	4	16.2	18.5	14.6	33.3
V49 Students’	12.5	4.1	5.6	16.2	18.2	12.9	30.5
V49 Parents’	5.5	1.9	3.1	13.5	21.3	16.9	37.8
V50 Teachers’	12.3	4	5.1	13.4	18.4	19.8	27
V50 Students’	10	3.2	4.3	15.4	18.8	16.1	32.2
V50 Parents’	8.4	2.6	4.1	13.4	19.9	21.2	30.4
V51 Teachers’	3.9	1.6	5.1	12.6	21.6	22.7	32.5
V51 Students’	5.9	2.3	3.7	13.2	19.3	20.6	34.9
V51 Parents’	2.9	1.4	4.9	15.1	23.4	22.6	29.7
V52 Teachers’	4.3	1.7	4.7	16.6	21.3	22.2	29.2
V52 Students’	5.8	1.8	3.5	14.1	21.5	18.4	35
V52 Parents’	2.8	1.5	3.4	17.9	24.3	21.7	28.5
V53 Teachers’	8.6	4	7.6	20.3	24	17	18.4
V53 Students’	7.4	2.7	5.3	18.8	22.1	17.7	26
V53 Parents’	4.3	2.3	4.6	18.1	25.7	19.9	25.1
V54 Teachers’	4.5	0.8	2.1	4.7	8.5	11.8	67.6
V54 Students’	4.4	1.3	2.2	7.1	8.8	10.4	65.7
V54 Parents’	2.6	0.7	1.7	6.3	9.8	13.8	65.1
RV55 Teachers’	2.7	3.9	6.9	5.1	9	10.3	62.1
RV55 Students’	8.7	4.7	7.6	7.9	8.4	7.9	54.8
RV55 Parents’	5.4	4.6	6.8	8.6	11.5	8.5	54.6
RV56 Teachers’	3.9	3.2	6.3	5.3	8.9	11.4	60.9
RV56 Students’	8.7	4.2	7.3	9.0	8.6	7.7	54.4
RV56 Parents’	6.9	4.3	6.2	8.5	10.8	8.1	55.3
RV57 Teachers’	3.8	2.7	5.3	5.4	8.9	10	63.9
RV57 Students’	8.3	4.0	6.5	9.0	8.7	7.6	55.8
RV57 Parents’	6.0	3.8	5.8	8.9	10.3	8.3	56.9

Table 11.55: Questionnaire Descriptive Statistics

ITEMS	MEDIAN	SKEWNESS	KURTOSIS	MINIMUM	MAXIMUM
V01 Teachers’	5	-0.586	-1.101	1	7
V01 Students’	5	-0.68	-0.809	1	7
V01 Parents’	6	-1.058	-0.069	1	7
V02 Teachers’	5	-0.298	-1.503	1	7
V02 Students’	5	-0.463	-1.094	1	7
V02 Parents’	6	-0.94	-0.277	1	7

V03 Teachers'	5	-0.327	-1.322	1	7
V03 Students'	5	-0.483	-1.073	1	7
V03 Parents'	6	-0.965	-0.239	1	7
V04 Teachers'	5	-0.749	-0.756	1	7
V04 Students'	6	-0.765	-0.734	1	7
V04 Parents'	6	-1.04	-0.169	1	7
V05 Teachers'	5	-0.58	-1.031	1	7
V05 Students'	5	-0.596	-0.968	1	7
V05 Parents'	6	-0.945	-0.339	1	7
V06 Teachers'	5	-0.315	-1.42	1	7
V06 Students'	5	-0.641	-0.955	1	7
V06 Parents'	6	-0.936	-0.375	1	7
V07 Teachers'	6	-0.84	-0.622	1	7
V07 Students'	6	-1.011	-0.282	1	7
V07 Parents'	6	-1.076	-0.015	1	7
V08 Teachers'	6	-0.617	-1.124	1	7
V08 Students'	6	-1.154	0.127	1	7
V08 Parents'	6	-1.133	0.094	1	7
V09 Teachers'	5	-0.521	-1.286	1	7
V09 Students'	6	-1.016	-0.308	1	7
V09 Parents'	6	-1.065	-0.12	1	7
V10 Teachers'	5	-0.364	-1.352	1	7
V10 Students'	6	-0.853	-0.517	1	7
V10 Parents'	6	-0.888	-0.415	1	7
V11 Teachers'	5	-0.454	-1.16	1	7
V11 Students'	5	-0.684	-0.766	1	7
V11 Parents'	6	-0.921	-0.325	1	7
V12 Teachers'	5	-0.271	-1.308	1	7
V12 Students'	5	-0.664	-0.792	1	7
V12 Parents'	6	-0.806	-0.478	1	7
V13 Teachers'	5	-0.712	-0.747	1	7
V13 Students'	6	-1.031	0.005	1	7
V13 Parents'	6	-1.185	0.48	1	7
RV14 Teachers'	4	-0.082	-1.072	1	7
RV14 Students'	4	0.107	-1.139	1	7
RV14 Parents'	4	-0.008	-1.169	1	7
V15 Teachers'	5	-0.351	-1.171	1	7
V15 Students'	5	-0.552	-0.856	1	7

V15 Parents'	5	-0.748	-0.495	1	7
V16 Teachers'	5	-0.253	-1.268	1	7
V16 Students'	5	-0.596	-0.878	1	7
V16 Parents'	5	-0.679	-0.687	1	7
V17 Teachers'	5	-0.288	-1.202	1	7
V17 Students'	5	-0.516	-0.975	1	7
V17 Parents'	5	-0.732	-0.562	1	7
V18 Teachers'	4	-0.02	-1.468	1	7
V18 Students'	5	-0.323	-1.272	1	7
V18 Parents'	5	-0.595	-0.843	1	7
V19 Teachers'	4	-0.002	-1.374	1	7
V19 Students'	5	-0.306	-1.168	1	7
V19 Parents'	5	-0.584	-0.754	1	7
V20 Teachers'	4	0.116	-1.403	1	7
V20 Students'	4	-0.137	-1.341	1	7
V20 Parents'	5	-0.453	-0.938	1	7
V21 Teachers'	4	-0.075	-1.417	1	7
V21 Students'	5	-0.346	-1.21	1	7
V21 Parents'	5	-0.49	-0.949	1	7
V22 Teachers'	5	-0.194	-1.279	1	7
V22 Students'	5	-0.506	-1.045	1	7
V22 Parents'	5	-0.48	-0.995	1	7
V23 Teachers'	4	-0.196	-1.12	1	7
V23 Students'	5	-0.354	-1.128	1	7
V23 Parents'	5	-0.428	-0.806	1	7
V24 Teachers'	4	-0.199	-1.122	1	7
V24 Students'	5	-0.4	-1.12	1	7
V24 Parents'	5	-0.484	-0.759	1	7
V25 Teachers'	5	-0.498	-1.077	1	7
V25 Students'	5	-0.307	-1.369	1	7
V25 Parents'	4	-0.047	-1.366	1	7
V26 Teachers'	6	-0.82	-0.487	1	7
V26 Students'	6	-0.868	-0.449	1	7
V26 Parents'	5	-0.771	-0.477	1	7
V27 Teachers'	2	0.776	-0.828	1	7
V27 Students'	5	-0.623	-0.932	1	7
V27 Parents'	5	-0.653	-0.652	1	7

V28 Teachers’	1	1.385	0.564	1	7
V28 Students’	4	-0.166	-1.432	1	7
V28 Parents’	5	-0.373	-1.161	1	7
V29 Teachers’	1	1.078	-0.284	1	7
V29 Students’	5	-0.504	-1.033	1	7
V29 Parents’	5	-0.416	-1.037	1	7
V30 Teachers’	3	0.471	-1.097	1	7
V30 Students’	4	0.109	-1.37	1	7
V30 Parents’	4	-0.111	-1.109	1	7
V31 Teachers’	3	0.462	-1.104	1	7
V31 Students’	4	0.277	-1.291	1	7
V31 Parents’	4	0.086	-1.146	1	7
V32 Teachers’	4	0.076	-1.414	1	7
V32 Students’	4	-0.001	-1.462	1	7
V32 Parents’	4	-0.266	-1.225	1	7
V33 Teachers’	6	-0.872	-0.565	1	7
V33 Students’	5	-0.467	-1.189	1	7
V33 Parents’	6	-0.969	-0.18	1	7
V34 Teachers’	6	-1.104	0.098	1	7
V34 Students’	5	-1.009	-1.009	1	7
V34 Parents’	6	-0.941	-0.207	1	7
V35 Teachers’	5	-0.771	-0.573	1	7
V35 Students’	5	-0.468	-1.09	1	7
V35 Parents’	5	-0.818	-0.432	1	7
V36 Teachers’	5	-0.612	-0.987	1	7
V36 Students’	5	-0.367	-1.119	1	7
V36 Parents’	5	-0.45	-0.985	1	7
V37 Teachers’	5	-0.247	-1.244	1	7
V37 Students’	4	-0.275	-1.148	1	7
V37 Parents’	5	-0.369	-1.015	1	7
V38 Teachers’	5	-0.367	-1.095	1	7
V38 Students’	5	-0.495	-0.937	1	7
V38 Parents’	5	-0.514	-0.857	1	7
V39 Teachers’	5	-0.529	-0.763	1	7
V39 Students’	5	-0.697	-0.711	1	7
V39 Parents’	5	-0.667	-0.401	1	7
V40 Teachers’	5	-0.622	-0.589	1	7
V40 Students’	5	-0.679	-0.695	1	7

V40 Parents’	5	-0.764	-0.244	1	7
V41 Teachers’	5	-0.791	-0.408	1	7
V41 Students’	5	-0.781	-0.521	1	7
V41 Parents’	5	-0.874	-0.241	1	7
RV42 Teachers’	4	0.026	-1.043	1	7
RV42 Students’	4	0.214	-1.07	1	7
RV42 Parents’	4	0.158	-0.953	1	7
V43 Teachers’	5	-0.233	-1.397	1	7
V43 Students’	5	-0.206	-1.368	1	7
V43 Parents’	5	-0.223	-1.327	1	7
V44 Teachers’	5	-0.292	-1.298	1	7
V44 Students’	5	-0.262	-1.237	1	7
V44 Parents’	5	-0.346	-1.163	1	7
V45 Teachers’	4	-0.050	-1.440	1	7
V45 Students’	4	-0.064	-1.462	1	7
V45 Parents’	4	-0.075	-1.443	1	7
RV97 Teachers’	2	1.013	-0.344	1	6
RV97 Students’	3	0.054	-1.587	1	6
RV97 Parents’	3	0.197	-1.373	1	6
V98 Teachers’	2	0.431	-1.297	1	5
V98 Students’	3	-0.3	-1.228	1	5
V98 Parents’	4	-0.317	-1.203	1	5
V46 Teachers’	5	-0.537	-1.066	1	7
V46 Students’	5	-0.54	-1.009	1	7
V46 Parents’	5	-0.68	-0.594	1	7
V47 Teachers’	5	-0.757	-0.563	1	7
V47 Students’	6	-0.837	-0.406	1	7
V47 Parents’	6	-1.147	-0.741	1	7
V48 Teachers’	5	-0.869	-0.193	1	7
V48 Students’	6	-0.878	-0.263	1	7
V48 Parents’	6	-1.225	1.121	1	7
V49 Teachers’	5	-0.815	-0.356	1	7
V49 Students’	5	-0.633	-0.746	1	7
V49 Parents’	6	-1.097	0.642	1	7
V50 Teachers’	5	-0.75	-0.581	1	7
V50 Students’	5	-0.828	-0.317	1	7
V50 Parents’	6	-0.976	0.107	1	7

V51 Teachers’	6	-1.047	0.703	1	7
V51 Students’	6	-1.079	0.506	1	7
V51 Parents’	6	-0.916	0.59	1	7
V52 Teachers’	6	-0.931	0.474	1	7
V52 Students’	6	-1.056	0.561	1	7
V52 Parents’	6	-0.856	0.609	1	7
V53 Teachers’	5	-0.583	-0.376	1	7
V53 Students’	5	-0.765	-0.092	1	7
V53 Parents’	5	-0.816	-0.355	1	7
V54 Teachers’	7	-2.134	3.886	1	7
V54 Students’	7	-1.884	2.769	1	7
V54 Parents’	7	-2.093	4.249	1	7
RV55 Teachers’	7	-1.473	0.983	1	7
RV55 Students’	7	-1.023	-0.393	1	7
RV55 Parents’	7	-1.122	0.006	1	7
RV56 Teachers’	7	-1.506	1.123	1	7
RV56 Students’	7	-1.02	-0.367	1	7
RV56 Parents’	7	-1.136	-0.015	1	7
RV57 Teachers’	7	-1.632	1.589	1	7
RV57 Students’	7	-1.087	-0.203	1	7
RV57 Parents’	7	-1.213	0.226	1	7
V58 Teachers’	9	-0.839	-0.409	1	10
V58 Students’	7	-0.462	-0.87	1	10
V58 Parents’	8	-0.734	-0.517	1	10
V59 Teachers’	8	-0.758	-0.547	1	10
V59 Students’	7	-0.45	-0.951	1	10
V59 Parents’	8	-0.694	-0.559	1	10
V60 Teachers’	10	-1.198	0.386	1	10
V60 Students’	9	-0.86	-0.374	1	10
V60 Parents’	9	-0.918	-0.202	1	10
V61 Teachers’	7	-0.502	-0.912	1	10
V61 Students’	5	-0.188	-1.237	1	10
V61 Parents’	6	-0.396	-0.989	1	10
V62 Teachers’	8	-0.825	-0.368	1	10
V62 Students’	7	-0.516	-0.882	1	10
V62 Parents’	8	-0.729	-0.521	1	10

Appendix H

Demographics summary statistics

Frequencies

Frequency Table

V84 -Q80-Teachers', -Q69-Students' & -Q84-Parents' Experience Using Noor

Group		Frequency	Percent
Teachers'	Less than 6 months	93	5.6
	6-12 months	95	5.7
	1-2 years	180	10.9
	2-3 years	304	18.4
	3-4 years	323	19.5
	4 years or more	660	39.9
	Total	1655	100.0
Students'	Less than 6 months	482	13.1
	6-12 months	394	10.7
	1-2 years	724	19.7
	2-3 years	807	22.0
	3-4 years	623	17.0
	4 years or more	636	17.3
	Total	3666	100.0
Parents'	Less than 6 months	971	18.0
	6-12 months	535	9.9
	1-2 years	1200	22.3
	2-3 years	987	18.3
	3-4 years	652	12.1

	4 years or more	1045	19.4
	Total	5390	100.0

V63 Age

Group		Frequency	Percent
Teachers’	18 to 25 years	31	1.9
	25 to 35 years	699	42.2
	35 to 45 years	676	40.8
	45 to 55 years	221	13.4
	more than 55 years	28	1.7
	Total	1655	100.0
Students’	less than 15	270	7.4
	15 to 16 years	551	15.0
	16 to 17 years	699	19.1
	17 to 18 years	810	22.1
	18 to 25 years	1336	36.4
	Total	3666	100.0
Parents’	18 to 25 years	132	2.4
	25 to 35 years	898	16.7
	35 to 45 years	2877	53.4
	45 to 55 years	1306	24.2
	more than 55 years	177	3.3
	Total	5390	100.0

V64 Gender

Group		Frequency	Percent
Teachers'	Male	1390	84.0
	Female	265	16.0
	Total	1655	100.0
Students'	Male	2736	74.6
	Female	930	25.4
	Total	3666	100.0
Parents'	Male	4698	87.2
	Female	692	12.8
	Total	5390	100.0

V69 -Q67-Teachers' & -Q69-Parents'-Use Noor System for Monitoring Children

Group		Frequency	Percent
Teachers'	No	361	21.8
	Yes	607	36.7
	NA	687	41.5
	Total	1655	100.0
Students'	NA	3666	100.0
Parents'	No	1741	32.3
	Yes	3649	67.7
	Total	5390	100.0

V78 -Q74-Teachers' & -Q74-Parents' Monthly Income

Group		Frequency	Percent
Teachers'	Less than SR3,000	126	7.6
	SR3,000 to SR5,999	217	13.1
	SR6,000 to SR8,999	101	6.1
	SR9,000 to SR11,999	466	28.2
	SR12,000 to SR14,999	389	23.5
	SR15,000 to SR17,999	198	12.0
	SR18,000 or more	158	9.5
	Total	1655	100.0
Students'	NA	3666	100.0
Parents'	Less than SR3,000	303	5.6
	SR3,000 to SR5,999	982	18.2
	SR6,000 to SR8,999	792	14.7
	SR9,000 to SR11,999	783	14.5
	SR12,000 to SR14,999	696	12.9
	SR15,000 to SR17,999	519	9.6
	SR18,000 or more	904	16.8
	NA	411	7.6
	Total	5390	100.0

V79 -Q75-Teachers' & -Q83-Parents' Education Level

Group		Frequency	Percent
Teachers'	Primary School	3	.2
	Intermediate School	1	.1
	Secondary School	4	.2

	Diploma Degree	76	4.6
	Bachelor Degree	1354	81.8
	Master Degree	202	12.2
	PhD or higher	15	.9
	Total	1655	100.0
Students’	NA	3666	100.0
Parents’	No Formal Education	5	.1
	Primary School	8	.1
	Intermediate School	140	2.6
	Secondary School	324	6.0
	Diploma Degree	1198	22.2
	Bachelor Degree	860	16.0
	Master Degree	2258	41.9
	PhD or higher	466	8.6
	Other	131	2.4
	Total	5390	100.0

V80 -Q76-Teachers’ & -Q75-Parents’ Job Region

Group		Frequency	Percent
Teachers’	Central Region	924	55.8
	West Region	688	41.6
	East Region	12	.7
	North Region	21	1.3
	South Region	9	.5
	Working in the diaspora	1	.1
	Total	1655	100.0

Students'	NA	3666	100.0
Parents'	Central Region	1907	35.4
	West Region	2870	53.2
	East Region	37	.7
	North Region	72	1.3
	South Region	84	1.6
	Working in the diaspora	9	.2
	NA	411	7.6
	Total	5390	100.0

V85 -Q81-Teachers', -Q70-Students' & -Q78-Parents' Attending Training

Group		Frequency	Percent
Teachers'	No	1416	85.6
	Yes	239	14.4
	Total	1655	100.0
Students'	No	3357	91.6
	Yes	309	8.4
	Total	3666	100.0
Parents'	No	5038	93.5
	Yes	352	6.5
	Total	5390	100.0

V87 -Q83-Teachers', -Q72-Students' & -Q82-Parents' Receiving Support with NOOR SYSTEM Account

Group		Frequency	Percent
Teachers'	No	1255	75.8
	Yes	400	24.2
	Total	1655	100.0
Students'	No	2617	71.4
	Yes	1049	28.6
	Total	3666	100.0
Parents'	No	4068	75.5
	Yes	1322	24.5
	Total	5390	100.0

V88 -Q84-Teachers', -Q73-Students' & -Q80-Parents' Used NOOR SYSTEM Help and Support

Group		Frequency	Percent
	No	729	44.0
Teachers'	Yes	926	56.0
	Total	1655	100.0
	No	2337	63.7
Students'	Yes	1329	36.3
	Total	3666	100.0
	No	3484	64.6
Parents'	Yes	1906	35.4
	Total	5390	100.0

V89-01 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Noor System Support

Group		Frequency	Percent
	No	1340	81.0
Teachers'	Yes	315	19.0
	Total	1655	100.0
	No	3210	87.6
Students'	Yes	456	12.4
	Total	3666	100.0
	No	4582	85.0
Parents'	Yes	808	15.0
	Total	5390	100.0

V89-02 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Noor System Official Forums

Group		Frequency	Percent
Teachers'	No	1553	93.8
	Yes	102	6.2
	Total	1655	100.0
Students'	No	3476	94.8
	Yes	190	5.2
	Total	3666	100.0
Parents'	No	5169	95.9
	Yes	221	4.1
	Total	5390	100.0

V89-03 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Noor System Non Official Forums

Group		Frequency	Percent
Teachers'	No	1552	93.8
	Yes	103	6.2
	Total	1655	100.0
Students'	No	3536	96.5
	Yes	130	3.5
	Total	3666	100.0
Parents'	No	5213	96.7
	Yes	177	3.3
	Total	5390	100.0

V89-04 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Search Engines

Group		Frequency	Percent
Teachers'	No	1456	88.0
	Yes	199	12.0
	Total	1655	100.0
Students'	No	3200	87.3
	Yes	466	12.7
	Total	3666	100.0
Parents'	No	4900	90.9
	Yes	490	9.1
	Total	5390	100.0

V89-05 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Friends

Group		Frequency	Percent
Teachers'	No	1194	72.1
	Yes	461	27.9
	Total	1655	100.0
Students'	No	3108	84.8
	Yes	558	15.2
	Total	3666	100.0
Parents'	No	4619	85.7
	Yes	771	14.3
	Total	5390	100.0

V89-06 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use School

Group		Frequency	Percent
	No	1202	72.6
Teachers'	Yes	453	27.4
	Total	1655	100.0
	No	2993	81.6
Students'	Yes	673	18.4
	Total	3666	100.0
	No	4702	87.2
Parents'	Yes	688	12.8
	Total	5390	100.0

V89-07 -Q85-Teachers', -Q74-Students' & -Q81-Parents' Help and Support-Use Other

Group		Frequency	Percent
	No	1647	99.5
Teachers'	Yes	8	.5
	Total	1655	100.0
	No	3648	99.5
Students'	Yes	18	.5
	Total	3666	100.0
	No	5357	99.4
Parents'	Yes	33	.6
	Total	5390	100.0

V90 -Q86-Teachers' & -Q77-Parents' Internet Access-Work

Group		Frequency	Percent
	No	459	27.7
Teachers’	Yes	1196	72.3
	Total	1655	100.0
Students’	NA	3666	100.0
	No	563	10.4
	Yes	4416	81.9
Parents’	NA	411	7.6
	Total	5390	100.0

V91 -Q87-Teachers’, -Q75-Students’ & -Q85-Parents’ Internet Access Home

Group		Frequency	Percent
	No	73	4.4
Teachers’	Yes	1582	95.6
	Total	1655	100.0
	No	178	4.9
Students’	Yes	3488	95.1
	Total	3666	100.0
	No	199	3.7
Parents’	Yes	5191	96.3
	Total	5390	100.0

V92 -Q88-Teachers', -Q76-Students' & -Q86-Parents' Internet Experience

Group		Frequency	Percent
	Less than 6 months	15	.9
	6-12 months	7	.4
	1-2 years	21	1.3
	2-3 years	21	1.3
Teachers'	3-4 years	51	3.1
	4-8 years	246	14.9
	8-12 years	331	20.0
	12 years or more	963	58.2
	Total	1655	100.0
	Less than 6 months	110	3.0
	6-12 months	77	2.1
	1-2 years	154	4.2
	2-3 years	195	5.3
Students'	3-4 years	488	13.3
	4-8 years	1115	30.4
	8-12 years	549	15.0
	12 years or more	978	26.7
	Total	3666	100.0
	Less than 6 months	152	2.8
	6-12 months	107	2.0
	1-2 years	151	2.8
Parents'	2-3 years	178	3.3
	3-4 years	343	6.4
	4-8 years	875	16.2

	8-12 years	989	18.3
	12 years or more	2595	48.1
	Total	5390	100.0

V93 -Q89-Teachers', -Q77-Students' & -Q87-Parents' Internet Proficiency

Group		Frequency	Percent
Teachers'	Very Low	15	.9
	Low	14	.8
	Satisfactory	147	8.9
	Good	261	15.8
	Very Good	588	35.5
	Excellent	630	38.1
	Total	1655	100.0
Students'	Very Low	45	1.2
	Low	34	.9
	Satisfactory	319	8.7
	Good	625	17.0
	Very Good	1206	32.9
	Excellent	1437	39.2
	Total	3666	100.0
Parents'	Very Low	43	.8
	Low	73	1.4
	Satisfactory	688	12.8
	Good	1180	21.9
	Very Good	1873	34.7
	Excellent	1533	28.4

	Total	5390	100.0

V95 -Q91-Teachers', -Q79-Students' & -Q89-Parents' Average Time for Using The Internet

Group		Frequency	Percent
Teachers'	Less than 30 minutes	89	5.4
	30 minutes – 1 hour	285	17.2
	1– 2 hours	407	24.6
	2– 3 hours	301	18.2
	More than 3 hours	573	34.6
	Total	1655	100.0
Students'	Less than 30 minutes	240	6.5
	30 minutes – 1 hour	542	14.8
	1– 2 hours	743	20.3
	2– 3 hours	570	15.5
	More than 3 hours	1571	42.9
	Total	3666	100.0
Parents'	Less than 30 minutes	487	9.0
	30 minutes – 1 hour	1053	19.5
	1– 2 hours	1295	24.0
	2– 3 hours	825	15.3
	More than 3 hours	1730	32.1
	Total	5390	100.0

V99 -Q95-Teachers', -Q83-Students' & -Q93-Parents' Nationality

Group		Frequency	Percent
Teachers'	non-Saudis	249	15.0
	Saudi	1406	85.0
	Total	1655	100.0
Students'	non-Saudis	933	25.5
	Saudi	2733	74.5
	Total	3666	100.0
Parents'	non-Saudis	1497	27.8
	Saudi	3893	72.2
	Total	5390	100.0

Appendix I

Table 11.56: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Usefulness

Group	Nationality	Gender	p value	Partial Eta Squared
Teachers	non-Saudi	Female	0.003	0.517
		Male	<.001	0.418
	Saudi	Female	<.001	0.495
		Male	<.001	0.468
Students	non-Saudi	Female	<.001	0.346
		Male	<.001	0.347
	Saudi	Female	<.001	0.311
		Male	<.001	0.36
Parents	non-Saudi	Female	0.001	0.124
		Male	<.001	0.257
	Saudi	Female	<.001	0.258
		Male	<.001	0.286

Table 11.57: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Usefulness

Group	Nationality	Age	p value	Partial Eta Squared
Teachers	non-Saudi	18 to 25 years	0.11	0.627
		25 to 35 years	<.001	0.503
		35 to 45 years	<.001	0.374
		45 to 55 years	0.034	0.116
		Age 55 or older	<.001	0.844
	Saudi	18 to 25 years	<.001	0.466
		25 to 35 years	<.001	0.525
		35 to 45 years	<.001	0.434
		45 to 55 years	<.001	0.454
		Age 55 or older	0.001	0.512
Students	non-Saudi	Under 15 years	<.001	0.488
		15 to 16 years	<.001	0.318

		16 to 17 years	<.001	0.288
		17 to 18 years	<.001	0.312
		18 to 25 years	<.001	0.37
	Saudi	Under 15 years	<.001	0.303
		15 to 16 years	<.001	0.277
		16 to 17 years	<.001	0.344
		17 to 18 years	<.001	0.312
		18 to 25 years	<.001	0.406
Parents	non-Saudi	18 to 25 years	<.001	0.585
		25 to 35 years	<.001	0.322
		35 to 45 years	<.001	0.222
		45 to 55 years	<.001	0.225
		Age 55 or older	<.001	0.293
	Saudi	18 to 25 years	<.001	0.393
		25 to 35 years	<.001	0.287
		35 to 45 years	<.001	0.304
		45 to 55 years	<.001	0.228
		Age 55 or older	<.001	0.295

Table 11.58: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention

Independent variable: Perceived Usefulness

Group	Nationality	Education Level	p value	Partial Eta Squared
Teachers	non-Saudi	Diploma Degree	0.004	0.839
		Bachelor Degree	<.001	0.43
		Master Degree	0.035	0.15
		PhD or higher	0.103	0.974
	Saudi	Primary School	_	1
		Secondary School	0.041	0.996
		Diploma Degree	<.001	0.673
		Bachelor Degree	<.001	0.471
		Master Degree	<.001	0.488
		PhD or higher	0.011	0.489
Parents	non-Saudi	No Formal Education	_	1
		Primary School	0.716	0.186
		Intermediate School	<.001	0.66
		Secondary School	<.001	0.316

	Diploma Degree	<.001	0.257
	Bachelor Degree	<.001	0.281
	Master Degree	<.001	0.189
	PhD or higher	<.001	0.327
	Other	<.001	0.385
Saudi	No Formal Education	0.682	0.229
	Primary School	0.045	0.787
	Intermediate School	<.001	0.523
	Secondary School	<.001	0.274
	Diploma Degree	<.001	0.329
	Bachelor Degree	<.001	0.228
	Master Degree	<.001	0.276
	PhD or higher	<.001	0.197
	Other	<.001	0.157

Table 11.59: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Usefulness

Group	Nationality	Experience Using Noor	p value	Partial Eta Squared
Teachers	non-Saudi	Less than 6 months	<.001	0.467
		6-12 months	0.001	0.343
		1-2 years	<.001	0.45
		2-3 years	<.001	0.6
		3-4 years	0.006	0.267
		4 years or more	<.001	0.388
	Saudi	Less than 6 months	<.001	0.465
		6-12 months	<.001	0.395
		1-2 years	<.001	0.626
		2-3 years	<.001	0.562
		3-4 years	<.001	0.461
		4 years or more	<.001	0.448
Students	non-Saudi	Less than 6 months	<.001	0.493
		6-12 months	<.001	0.497
		1-2 years	<.001	0.173
		2-3 years	<.001	0.42
		3-4 years	<.001	0.365
		4 years or more	<.001	0.281
	Saudi	Less than 6 months	<.001	0.316
		6-12 months	<.001	0.491
		1-2 years	<.001	0.331

		2-3 years	<.001	0.325
		3-4 years	<.001	0.282
		4 years or more	<.001	0.421
Parents	non-Saudi	Less than 6 months	<.001	0.419
		6-12 months	<.001	0.359
		1-2 years	<.001	0.203
		2-3 years	<.001	0.208
		3-4 years	<.001	0.23
		4 years or more	<.001	0.164
	Saudi	Less than 6 months	<.001	0.352
		6-12 months	<.001	0.24
		1-2 years	<.001	0.29
		2-3 years	<.001	0.24
		3-4 years	<.001	0.311
		4 years or more	<.001	0.261

Table 11.60: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Usefulness

Group	Nationality	Internet Proficiency	p value	Partial Eta Squared
Teachers	non-Saudi	Very Low	0.388	0.672
		Low	_	1
		Satisfactory	0.276	0.074
		Good	0.001	0.366
		Very Good	<.001	0.2
		Excellent	<.001	0.476
	Saudi	Very Low	<.001	0.802
		Low	<.001	0.73
		Satisfactory	<.001	0.529
		Good	<.001	0.385
		Very Good	<.001	0.486
		Excellent	<.001	0.491
Students	non-Saudi	Very Low	0.001	0.979
		Low	0.493	0.098
		Satisfactory	<.001	0.257
		Good	<.001	0.348
		Very Good	<.001	0.287
		Excellent	<.001	0.362
	Saudi	Very Low	<.001	0.284

		Low	0.004	0.29
		Satisfactory	<.001	0.258
		Good	<.001	0.311
		Very Good	<.001	0.368
		Excellent	<.001	0.347
Parents	non-Saudi	Very Low	0.001	0.739
		Low	<.001	0.62
		Satisfactory	<.001	0.29
		Good	<.001	0.3
		Very Good	<.001	0.252
		Excellent	<.001	0.183
	Saudi	Very Low	<.001	0.573
		Low	<.001	0.425
		Satisfactory	<.001	0.298
		Good	<.001	0.276
		Very Good	<.001	0.244
		Excellent	<.001	0.304

Table 11.61: Univariate test of Perceived Usefulness on Behavioural Intention; tests of Between-Subjects Effects.

Dependent Variable: Behavioural Intention
Independent variable: Perceived Usefulness

Group	Nationality	Internet Experience	p value	Partial Eta Squared
Teachers	non-Saudi	Less than 6 months	0.053	0.897
		1-2 years	0.983	0.001
		2-3 years	0.658	0.035
		3-4 years	0.007	0.618
		4-8 years	0.001	0.192
		8-12 years	<.001	0.304
		12 years or more	<.001	0.488
	Saudi	Less than 6 months	<.001	0.928
		6-12 months	0.005	0.815
		1-2 years	<.001	0.67
		2-3 years	0.013	0.441
		3-4 years	<.001	0.305
		4-8 years	<.001	0.488
		8-12 years	<.001	0.499
		12 years or more	<.001	0.473
Students	non-Saudi	Less than 6 months	0.001	0.422
		6-12 months	0.001	0.389
		1-2 years	<.001	0.392
		2-3 years	<.001	0.258

		3-4 years	<.001	0.395
		4-8 years	<.001	0.331
		8-12 years	<.001	0.306
		12 years or more	<.001	0.37
	Saudi	Less than 6 months	<.001	0.476
		6-12 months	0.004	0.155
		1-2 years	<.001	0.258
		2-3 years	<.001	0.326
		3-4 years	<.001	0.324
		4-8 years	<.001	0.296
		8-12 years	<.001	0.329
		12 years or more	<.001	0.421
Parents	non-Saudi	Less than 6 months	<.001	0.583
		6-12 months	0.001	0.444
		1-2 years	<.001	0.454
		2-3 years	<.001	0.266
		3-4 years	<.001	0.404
		4-8 years	<.001	0.248
		8-12 years	<.001	0.19
		12 years or more	<.001	0.245
	Saudi	Less than 6 months	<.001	0.362
		6-12 months	<.001	0.307
		1-2 years	<.001	0.388
		2-3 years	<.001	0.347
		3-4 years	<.001	0.369
		4-8 years	<.001	0.274
		8-12 years	<.001	0.241
		12 years or more	<.001	0.28

Appendix J

Table 11.62: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Ease of Use

Group	Nationality	Gender	p value	Partial Eta Squared
Teachers	non-Saudi	Female	0.001	0.612
		Male	<.001	0.33
	Saudi	Female	<.001	0.486
		Male	<.001	0.416
Students	non-Saudi	Female	<.001	0.233
		Male	<.001	0.328
	Saudi	Female	<.001	0.285
		Male	<.001	0.321
Parents	non-Saudi	Female	0.004	0.099
		Male	<.001	0.227
	Saudi	Female	<.001	0.305
		Male	<.001	0.264

Table 11.63: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Ease of Use

Group	Nationality	Age	p value	Partial Eta Squared
Teachers	non-Saudi	18 to 25 years	0.009	0.923
		25 to 35 years	<.001	0.327
		35 to 45 years	<.001	0.36
		45 to 55 years	0.024	0.13
		Age 55 or older	<.001	0.815
	Saudi	18 to 25 years	<.001	0.562
		25 to 35 years	<.001	0.436
		35 to 45 years	<.001	0.411
		45 to 55 years	<.001	0.455
		Age 55 or older	0.002	0.486
Students	non-Saudi	Under 15 years	<.001	0.408
		15 to 16 years	<.001	0.172

		16 to 17 years	<.001	0.159
		17 to 18 years	<.001	0.366
		18 to 25 years	<.001	0.442
	Saudi	Under 15 years	<.001	0.259
		15 to 16 years	<.001	0.26
		16 to 17 years	<.001	0.266
		17 to 18 years	<.001	0.261
		18 to 25 years	<.001	0.396
Parents	non-Saudi	18 to 25 years	<.001	0.462
		25 to 35 years	<.001	0.351
		35 to 45 years	<.001	0.19
		45 to 55 years	<.001	0.213
		Age 55 or older	0.112	0.058
	Saudi	18 to 25 years	<.001	0.35
		25 to 35 years	<.001	0.304
		35 to 45 years	<.001	0.287
		45 to 55 years	<.001	0.212
		Age 55 or older	<.001	0.212

Table 11.64: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Ease of Use

Group	Nationality	Education Level	p value	Partial Eta Squared
Teachers	non-Saudi	Diploma Degree	0.001	0.914
		Bachelor Degree	<.001	0.297
		Master Degree	0.002	0.306
		PhD or higher	0.022	0.999
	Saudi	Primary School	.	1
		Secondary School	0.11	0.97
		Diploma Degree	<.001	0.478
		Bachelor Degree	<.001	0.431
		Master Degree	<.001	0.449
		PhD or higher	0.02	0.436
Parents	non-Saudi	No Formal Education	.	1
		Primary School	0.274	0.826
		Intermediate School	<.001	0.579
		Secondary School	<.001	0.302
		Diploma Degree	<.001	0.24

		Bachelor Degree	<.001	0.261
		Master Degree	<.001	0.161
		PhD or higher	<.001	0.167
		Other	<.001	0.332
	Saudi	No Formal Education	0.774	0.12
		Primary School	0.014	0.898
		Intermediate School	<.001	0.422
		Secondary School	<.001	0.246
		Diploma Degree	<.001	0.331
		Bachelor Degree	<.001	0.198
		Master Degree	<.001	0.261
		PhD or higher	<.001	0.214
		Other	<.001	0.132

Table 11.65: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Ease of Use

Group	Nationality	Experience Using Noor	p value	Partial Eta Squared
Teachers	non-Saudi	Less than 6 months	0.002	0.379
		6-12 months	0.001	0.385
		1-2 years	<.001	0.256
		2-3 years	<.001	0.516
		3-4 years	0.07	0.125
		4 years or more	<.001	0.312
	Saudi	Less than 6 months	<.001	0.455
		6-12 months	<.001	0.391
		1-2 years	<.001	0.552
		2-3 years	<.001	0.542
		3-4 years	<.001	0.417
		4 years or more	<.001	0.394
Students	non-Saudi	Less than 6 months	<.001	0.427
		6-12 months	<.001	0.303
		1-2 years	<.001	0.192
		2-3 years	<.001	0.336
		3-4 years	<.001	0.372
		4 years or more	<.001	0.275
	Saudi	Less than 6 months	<.001	0.298
		6-12 months	<.001	0.395
		1-2 years	<.001	0.302
		2-3 years	<.001	0.257

		3-4 years	<.001	0.256
		4 years or more	<.001	0.377
Parents	non-Saudi	Less than 6 months	<.001	0.277
		6-12 months	<.001	0.286
		1-2 years	<.001	0.211
		2-3 years	<.001	0.243
		3-4 years	<.001	0.199
		4 years or more	<.001	0.079
	Saudi	Less than 6 months	<.001	0.274
		6-12 months	<.001	0.242
		1-2 years	<.001	0.281
		2-3 years	<.001	0.251
		3-4 years	<.001	0.258
		4 years or more	<.001	0.276

Table 11.66: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention

Independent variable: Perceived Ease of Use

Group	Nationality	Internet Proficiency	p value	Partial Eta Squared
Teachers	non-Saudi	Very Low	_	0
		Low	_	1
		Satisfactory	0.003	0.437
		Good	0.003	0.285
		Very Good	0.006	0.094
		Excellent	<.001	0.371
	Saudi	Very Low	<.001	0.835
		Low	0.001	0.652
		Satisfactory	<.001	0.492
		Good	<.001	0.397
		Very Good	<.001	0.414
		Excellent	<.001	0.433
Students	non-Saudi	Very Low	0.112	0.623
		Low	0.013	0.742
		Satisfactory	<.001	0.199
		Good	<.001	0.328
		Very Good	<.001	0.31
		Excellent	<.001	0.282
	Saudi	Very Low	<.001	0.683
		Low	<.001	0.655
		Satisfactory	<.001	0.289

		Good	<.001	0.261
		Very Good	<.001	0.299
		Excellent	<.001	0.305
Parents	non-Saudi	Very Low	0.013	0.516
		Low	0.001	0.524
		Satisfactory	<.001	0.229
		Good	<.001	0.23
		Very Good	<.001	0.235
		Excellent	<.001	0.158
	Saudi	Very Low	<.001	0.379
		Low	<.001	0.345
		Satisfactory	<.001	0.336
		Good	<.001	0.235
		Very Good	<.001	0.23
		Excellent	<.001	0.293

Table 11.67: Univariate test of Perceived Ease of Use on Behavioural Intention; tests of Between-Subjects Effects

Dependent Variable: Behavioural Intention
Independent variable: Perceived Ease of Use

Group	Nationality	Internet Experience	p value	Partial Eta Squared
Teachers	non-Saudi	Less than 6 months	0.025	0.951
		1-2 years	0.439	0.596
		2-3 years	<.001	0.945
		3-4 years	0.036	0.443
		4-8 years	<.001	0.266
		8-12 years	0.038	0.072
		12 years or more	<.001	0.451
	Saudi	Less than 6 months	<.001	0.922
		6-12 months	0.112	0.426
		1-2 years	0.004	0.408
		2-3 years	0.002	0.587
		3-4 years	<.001	0.441
		4-8 years	<.001	0.536
		8-12 years	<.001	0.426
		12 years or more	<.001	0.412
Students	non-Saudi	Less than 6 months	<.001	0.465
		6-12 months	0.001	0.378
		1-2 years	0.002	0.254
		2-3 years	<.001	0.355

		3-4 years	<.001	0.227
		4-8 years	<.001	0.318
		8-12 years	<.001	0.173
		12 years or more	<.001	0.385
	Saudi	Less than 6 months	<.001	0.454
		6-12 months	0.001	0.198
		1-2 years	<.001	0.277
		2-3 years	<.001	0.362
		3-4 years	<.001	0.339
		4-8 years	<.001	0.247
		8-12 years	<.001	0.241
		12 years or more	<.001	0.371
Parents	non-Saudi	Less than 6 months	<.001	0.475
		6-12 months	0.032	0.23
		1-2 years	0.001	0.275
		2-3 years	<.001	0.395
		3-4 years	<.001	0.421
		4-8 years	<.001	0.189
		8-12 years	<.001	0.206
		12 years or more	<.001	0.183
	Saudi	Less than 6 months	<.001	0.332
		6-12 months	<.001	0.477
		1-2 years	<.001	0.378
		2-3 years	<.001	0.296
		3-4 years	<.001	0.446
		4-8 years	<.001	0.235
		8-12 years	<.001	0.241
		12 years or more	<.001	0.254

Appendix K

Table 11.68: Summative table on the three groups

	Teachers		*Students*		*Parents*		*Decision on settings, mandatory/voluntary*
Hypotheses	*Beta Estimate*	*Decision*	*Beta Estimate*	*Decision*	*Beta Estimate*	*Decision*	*Strongest*
H1: USE <---BI	0.511	Significant	0.661	Significant	0.586	Significant	Voluntary/students
H2: BI <---PU	0.333	Significant	0.185	Significant	0.178	Significant	Mandatory/teachers
H3: BI <---PEOU	0.287	Significant	0.368	Significant	0.275	Significant	Voluntary/students
H3a: BI <---PEOU X EXP	-0.099	Significant	0.089	Significant	0.053	Significant	Voluntary/students
H4: PU <---PEOU	0.643	Significant	0.325	Significant	0.397	Significant	Mandatory/teachers
H4a: PU <---PEOU X EXP	-0.019	Non-significant	-0.053	Significant	-0.035	Significant	Voluntary/students
H5: BI <---SN	0.243	Significant	0.373	Significant	0.340	Significant	Voluntary/students
H5a: BI <---SN X EXP	0.074	Significant	-0.091	Significant	-0.092	Significant	Mandatory/Positive moderation on teachers
H5b: BI <---SN X VOL	_	_	_	_	_	_	Was not measured individually under the three groups. However, it was tested on the overall model. Moderation role reported.
H5c: BI <---SN X VOL	-0.099	Significant	_	_	_	_	Mandatory/Negative moderation on teachers.
H5d:BI <---SN X VOL X EXP	-0.015	Non-significant	_	_	_	_	No moderation
H5e: BI <---SN X VOL	_	_	-0.188	Significant	-0.134	Significant	Voluntary/moderates the students more

	Teachers		*Students*		*Parents*		*Decision on settings, mandatory/voluntary*
Hypotheses	*Beta Estimate*	*Decision*	*Beta Estimate*	*Decision*	*Beta Estimate*	*Decision*	*Strongest*
							negatively than the parents.
H5f:BI <---SN X VOL X EXP	_	_	0.034	Non-significant	0.042	Significant	Voluntary/moderate parents only
H6: PU <---SN	0.288	Significant	0.274	Significant	0.187	Significant	Mandatory/teachers
H6a: PU <---SN X EXP	0.046	Non-significant	0.097	Significant	0.086	Significant	Voluntary/moderates slightly more on students than parents
H7: IMG <---SN	0.619	Significant	0.666	Significant	0.682	Significant	Voluntary/parents
H8: PU <---IMG	0.089	Significant	0.125	Significant	0.058	Significant	Voluntary/students
H9: PU <---REL	0.292	Significant	0.538	Significant	0.568	Significant	Voluntary/parents
H9a: PU <---REL X OUT	0.003	Non-significant	0.009	Non-significant	-0.026	Non-significant	No moderation
H10: PU <---RES	0.061	Significant	-0.038	Significant	-0.07	Significant	Mandatory/teachers
H11: PEOU <---CSE	0.111	Significant	0.115	Significant	0.064	Significant	Voluntary/ students
H12: PEOU <---PEC	0.792	Significant	0.733	Significant	0.643	Significant	Mandatory/teachers
H13: PEOU <---CANX	0.032	Significant	0.084	Significant	0.053	Significant	Voluntary/students
H13a: PEOU <---CANX X EXP	0.003	Non-significant	0.017	Non-significant	0.029	Non-significant	No moderation
H15: PEOU <---ENJ	0.331	Significant	0.272	Significant	0.463	Significant	Voluntary/parents
H15a: PEOU <---ENJ X EXP	-0.015	Non-significant	-0.036	Non-significant	-0.055	Significant	Voluntary/Negative moderation on parents

Notes: PEOU= Perceived Ease of Use, IMG=Image, PU=Perceived Usefulness, BI=Behavioural Intention, USE=Use Behaviour, PEC=Perceptions of External Control, SN=Subjective Norm, ENJ=Perceived Enjoyment, REL=Job Relevance, RES=Results Demonstrability. H14, and H16 were not measured.

Appendix L

Table 11.69: The adjusted fit indices.

Models	*RMSEA*	*X2BS*	*ADJRMSEA*	*CFI*	*ADJCFI*	*TLI*	*ADJTLI*	*IFI*	*ADJIFI*	*BSFACTOR*
Overall model	0.092	913.172	0.004	0.847	1	0.837	1	0.847	1	81.377
Teachers' model	0.092	913.172	0.009	0.842	0.998	0.831	0.998	0.842	0.998	13.162
Students' model	0.091	913.172	0.006	0.843	0.999	0.833	0.999	0.843	0.999	27.643
Parents' model	0.096	913.172	0.005	0.846	1	0.836	1	0.846	1	44.977

Notes: RMSEA=Root Mean Standard Error Approximation, X2BS= Bollen–Stine Adjusted Chi-Square Equivalent Statistic, ADJRMSEA=Adjusted RMSEA, CFI= Comparative Fit Index, ADJCFI= Adjusted CFI, TLI=Tucker Lewis Index, ADJTLI= Adjusted TLI, IFI=Incremental Fit Index, ADJIFI= Adjusted IFI, BSFACTOR = Bollen–Stine Scaling Factor.

Appendix M

Table 11.70: Original Model with Items and Construct Reliabilities.

Items and Constructs **Recommended value**	***SRW (FL)*** **>.7**	***SFL*** **>.5**	***CA*** **>.7**	***CR*** **>.7**	**Decision** **Retain/Remove**
PU_06 <---Perceived Usefulness	0.862	0.743	0.968	0.945	Retain
PU_05 <---Perceived Usefulness	0.887	0.787			Retain
PU_04 <---Perceived Usefulness	0.869	0.755			Retain
PU_03 <---Perceived Usefulness	0.870	0.757			Retain
PU_02 <---Perceived Usefulness	0.851	0.724			Retain
PU_01 <---Perceived Usefulness	0.819	0.671			Retain
SN_01 <---Subjective Norm	0.948	0.899	0.847	0.852	Retain
SN_02 <---Subjective Norm	0.950	0.901			Retain
SN_03 <---Subjective Norm	0.526	0.277			Remove
SN_04 <---Subjective Norm	0.589	0.347			Remove
IMG_01 <---Image	0.838	0.702	0.881	0.884	Retain
IMG_02 <---Image	0.886	0.785			Retain
IMG_03 <---Image	0.816	0.666			Retain
REL_01 <---Job Relevance	0.915	0.837	0.950	0.951	Retain
REL_02 <---Job Relevance	0.962	0.925			Retain
REL_03 <---Job Relevance	0.913	0.834			Retain
RES_01 <---Results Demonstrability	0.872	0.760	0.647	0.910	Retain
RES_02 <---Results Demonstrability	0.914	0.835			Retain
RES_03 <---Results Demonstrability	0.847	0.717			Retain
RES_04 <---Results Demonstrability	-0.154	0.024			Remove
PEC_01 <---Perceptions of External Control	0.869	0.755	0.874	0.943	Retain
PEC_02 <---Perceptions of External Control	0.754	0.569			Retain
PEC_03 <---Perceptions of External Control	0.769	0.591			Retain
PEC_04 <---Perceptions of External Control	-0.096	-0.009			Remove
PEC_05 <---Perceptions of External Control	0.911	0.830			Retain
PEC_06 <---Perceptions of External Control	0.909	0.826			Retain
PEC_07 <---Perceptions of External Control	0.920	0.846			Retain

Items and Constructs	***SRW (FL)***	***SFL***	***CA***	***CR***	**Decision**
Recommended value	**>.7**	**>.5**	**>.7**	**>.7**	**Retain/Remove**
PEOU_01 <---Perceived Ease of Use	0.756	0.572	0.934	0.891	Retain
PEOU_02 <---Perceived Ease of Use	0.813	0.661			Retain
PEOU_03 <---Perceived Ease of Use	0.847	0.717			Retain
PEOU_04 <---Perceived Ease of Use	0.860	0.740			Retain
ENJ_01 <---Perceived Enjoyment	0.916	0.839	0.958	0.959	Retain
ENJ_02 <---Perceived Enjoyment	0.956	0.914			Retain
ENJ_03 <---Perceived Enjoyment	0.951	0.904			Retain
BI_01 <---Behavioural Intention	0.852	0.726	0.894	0.860	Retain
BI_02 <---Behavioural Intention	0.883	0.780			Retain
BI_03 <---Behavioural Intention	0.716	0.513			Retain
CSE_01 <---Computer Self-Efficacy	0.718	0.516	0.826	0.829	Retain
CSE_02 <---Computer Self-Efficacy	0.751	0.564			Retain
CSE_03 <---Computer Self-Efficacy	0.776	0.602			Retain
CSE_04 <---Computer Self-Efficacy	0.646	0.417			Remove
CSE_05 <---Computer Self-Efficacy	0.610	0.372			Remove
CANX_01 <---Computer Anxiety	0.213	0.045	0.811	0.836	Remove
CANX_02 <---Computer Anxiety	0.853	0.728			Retain
CANX_03 <---Computer Anxiety	0.913	0.834			Retain
CANX_04 <---Computer Anxiety	0.887	0.787			Retain
CPLAY_01 <---Computer Playfulness	0.528	0.279	0.737	0.745	Remove
CPLAY_02 <---Computer Playfulness	0.743	0.552			Retain
CPLAY_03 <---Computer Playfulness	0.830	0.689			Retain

Items and Constructs	***SRW (FL)***	***SFL***	***CA***	***CR***	**Decision**
Recommended value	**>.7**	**>.5**	**>.7**	**>.7**	**Retain/Remove**
CPLAY_04 <---Computer Playfulness	0.470	0.221			Remove
OU_01 <---Objective Usability	0.923	0.852	0.891	0.892	Retain
OU_02 <---Objective Usability	0.871	0.759			Retain
USE_01 <---Use Behaviour	0.717	0.514	0.835	0.826	Retain
USE_02 <---Use Behaviour	0.870	0.757			Retain
USE_03 <---Use Behaviour	0.755	0.570			Retain

Notes: SRW = Standardizes Regression Weights, FL = Factor Loadings, SFL = Squared Factor Loadings, CR = Composite Reliability, CA = Cronbach’s Alpha.

Table 11.71: The Final Revised Model with Items and Construct Reliabilities.

Items and Constructs Recommended value	SRW (FL) >.7	SFL >.5	CA >.7	CR >.7	Decision Retain/Remove
PU_06 <---Perceived Usefulness	0.865	0.748	0.968	0.946	Retain
PU_05 <---Perceived Usefulness	0.890	0.792			Retain
PU_04 <---Perceived Usefulness	0.872	0.760			Retain
PU_03 <---Perceived Usefulness	0.873	0.762			Retain
PU_02 <---Perceived Usefulness	0.854	0.729			Retain
PU_01 <---Perceived Usefulness	0.822	0.676			Retain
SN_01 <---Subjective Norm	0.947	0.897	0.950	0.950	Retain
SN_02 <---Subjective Norm	0.955	0.912			Retain
IMG_01 <---Image	0.838	0.702	0.881	0.884	Retain
IMG_02 <---Image	0.887	0.787			Retain
IMG_03 <---Image	0.815	0.664			Retain
REL_01 <---Job Relevance	0.915	0.837	0.950	0.951	Retain
REL_02 <---Job Relevance	0.962	0.925			Retain
REL_03 <---Job Relevance	0.913	0.834			Retain
RES_01 <---Results Demonstrability	0.872	0.760	0.909	0.91	Retain
RES_02 <---Results Demonstrability	0.914	0.835			Retain
RES_03 <---Results Demonstrability	0.847	0.717			Retain
PEC_01 <---Perceptions of External Control	0.869	0.755	0.943	0.943	Retain
PEC_02 <---Perceptions of External Control	0.756	0.572			Retain
PEC_03 <---Perceptions of External Control	0.772	0.596			Retain
PEC_05 <---Perceptions of External Control	0.910	0.828			Retain
PEC_06 <---Perceptions of External Control	0.909	0.826			Retain
PEC_07 <---Perceptions of External Control	0.918	0.843			Retain
PEOU_01 <---Perceived Ease of Use	0.785	0.616	0.934	0.907	Retain
PEOU_02 <---Perceived Ease of Use	0.838	0.702			Retain
PEOU_03 <---Perceived Ease of Use	0.868	0.753			Retain

Items and Constructs **Recommended value**	**SRW (FL)** **>.7**	**SFL** **>.5**	**CA** **>.7**	**CR** **>.7**	**Decision** **Retain/Remove**
PEOU_04 <---Perceived Ease of Use	0.877	0.769			Retain
ENJ_01 <---Perceived Enjoyment	0.916	0.839	0.958	0.959	Retain
ENJ_02 <---Perceived Enjoyment	0.956	0.914			Retain
ENJ_03 <---Perceived Enjoyment	0.951	0.904			Retain
BI_01 <---Behavioural Intention	0.855	0.731	0.894	0.862	Retain
BI_02 <---Behavioural Intention	0.886	0.785			Retain
BI_03 <---Behavioural Intention	0.720	0.518			Retain
CSE_01 <---Computer Self-Efficacy	0.718	0.516	0.796	0.798	Retain
CSE_02 <---Computer Self-Efficacy	0.746	0.557			Retain
CSE_03 <---Computer Self-Efficacy	0.795	0.632			Retain
CANX_02 <---Computer Anxiety	0.853	0.728	0.915	0.916	Retain
CANX_03 <---Computer Anxiety	0.914	0.835			Retain
CANX_04 <---Computer Anxiety	0.887	0.787			Retain
CPLAY_02 <---Computer Playfulness	0.995	0.990	0.776	0.815	Retain
CPLAY_03 <---Computer Playfulness	0.637	0.406			Retain
OU_01 <---Objective Usability	0.923	0.852	0.891	0.892	Retain
OU_02 <---Objective Usability	0.871	0.759			Retain
USE_01 <---Use Behaviour	0.718	0.516	0.878	0.827	Retain
USE_02 <---Use Behaviour	0.871	0.759			Retain
USE_03 <---Use Behaviour	0.756	0.572			Retain

Notes: SRW = Standardizes Regression Weights, FL = Factor Loadings, SFL = Squared Factor Loadings, CR = Composite Reliability.

Appendix N

Table 11.72: Summary of the literature citations as used in the Noor study

Chapters	Title	Source(s)
Chapter 1	1.2. Noor system.	(Abu-Ghazaleh, 2012; SPA, 2012; ITU, 2013).
	1.3. Background on IT in KSA.	(Atiyyah, 1989, p. 5; Hill et al., 1998; Wood, 2010; GAStat, 2016; Internet Live Stats, 2016).
	1.3.1. e-Government	(Abanumy et al., 2005, p. 102; AL-Shehry et al., 2006; Al-Ghaith et al., 2010; Al-Sobhi and Weerakkody, 2010, p. 14; Alshehri and Drew, 2010; Al-Sobhi et al., 2011; Alateyah et al., 2013, p. 601; Weerakkody et al., 2013).
	1.3.2. e-Commerce	(Sait et al., 2004; Al-Maghrabi and Dennis, 2009; Al-Hudhaif and Alkubeyyer, 2011; Al-Maghrabi et al., 2011; AlGhamdi et al., 2011; Almoawi and Mahmood, 2011; Eid, 2011; AlGhamdi et al., 2012; Al-Somali et al., 2013; Brosdahl and Almousa, 2013).
	1.3.3. e-Finance	Alsajjan and Dennis (2010)
	1.3.4. e-Health	Altuwaijri (2008, p. 176).
	1.3.5. e-Education	(Loyd and Gressard, 1984; Loyd and Loyd, 1985; Al-Khaldi and Al-Jabri, 1998; Al-Asmari, 2005, p. 149; Albalawi, 2007, p. 90 & 92; Al-Fahad, 2009; Alebaikan and Troudi, 2010; Alenezi et al., 2010; Ahmed et al., 2011; Al-Harbi, 2011, p. 42); Alebaikan (2011); (Asiri et al., 2012; Nassuora, 2012; Seliaman and Al-Turki, 2012).
	1.4. Motivation for this Research	(Benbasat and Barki, 2007; Hirschheim, 2007; AES, 2013; AL-Ghamdi, 2015; Mardiana et al., 2015; Rondan-Cataluña et al., 2015).
	1.7. Research significance	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
Chapter 2	2.1. Introduction	(Al-Khaldi and Wallace, 1999; Sait et al., 2003; Al-Gahtani, 2004; Kolsaker et al., 2007; Sait and Al-Tawil, 2007, p. 30; Anderson et al., 2008; Venkatesh and Bala, 2008).
	2.1.1. Information Technology Acceptance	(Davis, 1986; Gattiker, 1990, p. 6; Karahanna et al., 1999; Agarwal, 2000; Chau and Hu, 2001; DeLacey and Leonard, 2002; Radcliffe, 2002; Lee et al., 2003; Oliveira and Martins, 2010).
	2.1.2. The Models and Theories of Individual Acceptance	(Dillon and Morris, 1996, p. 7; Agarwal, 2000)
	2.1.2.1. Theory of Reasoned Action (TRA).	(Ajzen, 1967; Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980, p. 180; Ajzen and Fishbein, 1988; Davis, 1989; Davis et al., 1989); Ajzen (1991, p.181); (2000; Shih, 2004; Chuchinprakarn, 2005; Downs and Hausenblas, 2005, p. 77; Ok and Shon, 2006, p. 10; Albarq and Alsughayir, 2013, p. 23; Mishra et al., 2014).
	2.1.2.2. Technology Acceptance Model (TAM)	(Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Davis, 1986; Davis et al., 1989; Adams et al., 1992; Chau, 1996; Agarwal and Prasad, 1997; Agarwal and Prasad,

		1999; Karahanna and Limayem, 2000; Venkatesh and Davis, 2000; Dasgupta et al., 2002; Yousafzai et al., 2007a; Al-Gahtani, 2008).
	2.1.2.3. Extension of TAM2	Venkatesh and Davis (2000).
	2.1.2.3.1. Social Influence Mechanisms	(Venkatesh and Davis, 2000; Venkatesh and Bala, 2008, p.277)
	2.1.2.3.1.1. Subjective Norm	(Fishbein and Ajzen, 1975, p.302; Moore and Benbasat, 1991, p. 195; Venkatesh and Davis, 2000)
	2.1.2.3.1.2. Image and Social Influence	(Moore and Benbasat, 1991, p. 195; Venkatesh and Davis, 2000, p.189)
	2.1.2.3.2. Cognitive Instrumental Processes	(Venkatesh and Davis, 2000; Venkatesh and Bala, 2008).
	2.1.2.3.2.1. Job Relevance	Venkatesh and Davis (2000, p.191)
	2.1.2.3.2.2. Output Quality	(Venkatesh and Davis, 2000; Venkatesh and Bala, 2008, p.277).
	2.1.2.3.2.3. Result Demonstrability	(Venkatesh and Davis, 2000; Venkatesh and Bala, 2008, p.277).
	2.1.2.3.2.4. Perceived Ease of Use (PEOU)	(Venkatesh and Davis, 2000; Venkatesh and Bala, 2008).
	2.1.2.3.2.5. Changes in Cognitive Instrumental Influences with Experience	Venkatesh and Davis (2000).
	2.1.2.4. The development to the TAM3.	(Venkatesh, 2000; Venkatesh and Davis, 2000; Venkatesh and Bala, 2008).
	2.1.2.4.1. The model of determinants of PEOU	(Venkatesh, 2000; Venkatesh and Bala, 2008).
	2.1.2.4.1.1.1. Computer Self-Efficacy	Venkatesh and Bala (2008, p. 278).
	2.1.2.4.1.1.1. Computer Anxiety	Venkatesh (2000).
	2.1.2.4.1.1.2. Computer Playfulness	(Venkatesh, 2000, p. 348; Venkatesh and Davis, 2000).
	2.1.2.4.1.1.3. Perceptions of External Control (Facilitating Conditions)	Venkatesh and Davis (2000).
	2.1.2.4.1.2.1. Perceived Enjoyment	(Venkatesh, 2000, p. 351; Venkatesh and Davis, 2000).
	2.1.2.4.1.2.2. Objective Usability	Venkatesh (2000, p. 350 & 351).
	2.1.2.4.2.3. Perceved Ease of Use and Behavioural Intention	Venkatesh and Bala (2008).
	2.1.2.5. Motivational Model	(Blais et al., 1990, p. 1022; Deci et al., 1991, p. 329 & 330; Cooper et al., 1995, p. 991; Vallerand et al., 1997, p. 1169; Ryan and Deci, 2000, p. 54; Hardre and Reeve, 2003, p. 355).

	2.1.2.6. Theory of Planned Behaviour	(Ajzen and Fishbein, 1988, p. 3; Ajzen, 1991; Downs and Hausenblas, 2005; Ok and Shon, 2006; Baker et al., 2007, p. 368 & 369).
	2.1.2.7. Combined Technology Acceptance Model and the Theory of Planned Behaviour	Taylor and Todd (1995a, p. 565)
	2.1.2.8. Model of PC Utilisation (MPCU)	Thompson et al. (1991)
	2.1.2.9. Diffusion of Innovation Theory (DoI).	(Rogers Everett, 1995, p. 5; Al-Gahtani, 2003; Al-Jabri and Sohail, 2012).
	2.1.2.10. Social Cognitive Theory (SCT)	(Bandura, 1977; Luszczynska and Schwarzer, 2005, p. 11).
	2.1.2.11. Unified Theory of Acceptance and Use of Technology	(Venkatesh et al., 2003; Al-Gahtani et al., 2007).
	2.2. Technology Acceptance Model in Relation to The Approaches to Evaluating Technology Acceptance	(Bandura, 1977; Ajzen and Fishbein, 1988; Blais et al., 1990, p. 1029; Ajzen, 1991, p. 185; Mathieson, 1991; Schunk, 1991; Bagozzi et al., 1992; Kurland, 1995, p. 4; Venkatesh and Davis, 2000; Chau and Hu, 2001; Hardre and Reeve, 2003; Downs and Hausenblas, 2005; Lavigne et al., 2007, p. 363; Hamre, 2008; Nabi and Clark, 2008, p. 425; MacVaugh and Schiavone, 2010, p. 207; Moghavvemi et al., 2013; Waehama et al., 2014; Call et al., 2016).
	2.3. A Review of Technology Acceptance Model Studies Conducted in the Middle Eastern Countries	(1989; Ghorab, 1997; Rose and Straub, 1998, p. 45; Venkatesh and Davis, 2000; Selim, 2003; Akour et al., 2006; Al-Khateeb, 2007; Al-Gahtani, 2008; Anderson et al., 2008; Baker et al., 2010; Harby et al., 2010, p. 51; Anderson et al., 2011, p. 33).
	2.4.1. The Application of Technology Acceptance Model Studies in The Middle East	(Ghorab, 1997; Rose and Straub, 1998; Aladwani and Aladwani, 2002; Selim, 2003; Al-Khateeb, 2007).
	2.4.2. The Application of Technology Acceptance Model Studies in the Kingdom of Saudi Arabia	Harby et al. (2010).
	2.4.3. The Application of Technology Acceptance Model 2 Studies in The Middle East	Akour et al. (2006).
	2.4.4. The Application of Technology Acceptance Model 2 Studies in The Kingdom of Saudi Arabia.	(Al-Gahtani, 2008; Anderson et al., 2008; Baker et al., 2010; Anderson et al., 2011).
	2.4.5. The Application of The Technology	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).

	Acceptance Model 3 Studies in The Middle East	
	2.5. Technology Acceptance Model 3 Studies Outside The Middle East	(Fishbein and Ajzen, 1975; Davis, 1986; Venkatesh and Davis, 2000; Venkatesh and Bala, 2008).
	2.5.2. Technology Acceptance Model 3 Studies Search Criteria	(Venkatesh and Davis, 2000; Yousafzai et al., 2007a; Yousafzai et al., 2007b; Venkatesh and Bala, 2008).
	2.5.3. Technology Acceptance Model 3 Studies Outside The Middle East	Venkatesh and Bala (2008).
	2.5.4. Technology Acceptance Model 3 Studies Without The Adjustments (Perceived Enjoyment and Objective Usability)	(Gu et al., 2009; Arenas-Gaitan et al., 2011; Klerks, 2011; Huang et al., 2012; Agudo-Peregrina et al., 2014; Wook et al., 2014; Abdullah and Ward, 2016).
	2.5.5. Technology Acceptance Model 3 Studies with Intention to Use (Technology Acceptance Model 2) and Attitude	(Ghorab, 1997; Rose and Straub, 1998; Aladwani and Aladwani, 2002; Selim, 2003; Akour et al., 2006; Al-Khateeb, 2007; Al-Gahtani, 2008; Anderson et al., 2008; Park, 2009; Yu, 2009; Baker et al., 2010; Harby et al., 2010; Anderson et al., 2011; Hong et al., 2011; Šumak et al., 2011; Zhang et al., 2012; Al-Adwan et al., 2013; Padilla-Melendez et al., 2013; Alharbi and Drew, 2014; Chen and Chan, 2014; Morosan and DeFranco, 2014; Teo and Zhou, 2014; Abdullah and Seng, 2015; Fathema et al., 2015; Liu and Huang, 2015; Son et al., 2015; Abdullah and Ward, 2016; Al-Gahtani, 2016)
	2.6. The Role of Social Influence in Information Systems	(Campbell, 1979; Hofstede, 1984; Ali and Al-Shakis, 1985; Dadfar, 1990; Straub et al., 1997; Png et al., 2001; Straub et al., 2001; Dadfar et al., 2003; Al-Gahtani, 2004; Baker et al., 2007; Kolsaker et al., 2007; Al-Gahtani, 2008; Baker et al., 2010; Sidani and Thornberry, 2010; Datta, 2011; Hu et al., 2014).
	2.7. The Effect of Retaining or Discarding Use Behaviour as the Main Dependent Variable in Technology Acceptance Model 3 Under a Self-Reported System Usage	(Davis, 1989; Adams et al., 1992; Straub et al., 1995; Szajna, 1996; Wynne and Chin, 1996; Legris et al., 2003; Ma and Liu, 2004; Yousafzai et al., 2007b; Lai et al., 2008; Wu and Du, 2012).
Chapter 3	3.2. The Effect of Behavioural Intention on Use Behaviour of the Noor System in	(Ajzen, 1991, p. 181; Al-Gahtani, 2008; Venkatesh and Bala, 2008).

	Technology Acceptance Model 3	
	3.3. The Effect of Perceived Usefulness on Behavioural Intention in Technology Acceptance Model 3	(Ghorab, 1997; Aladwani and Aladwani, 2002; Selim, 2003; Akour et al., 2006; Al-Khateeb, 2007; Al-Gahtani, 2008; Venkatesh and Bala, 2008; Harby et al., 2010; Anderson et al., 2011).
	3.4. The Effect of Perceived Ease of Use on Behavioural Intention	(Aladwani and Aladwani, 2002; Akour et al., 2006; Venkatesh and Bala, 2008; Anderson et al., 2011).
	3.5. The Effect of Perceived Ease of Use on Perceived Usefulness	(Rose and Straub, 1998; Selim, 2003; Al-Gahtani, 2008; Anderson et al., 2008; Venkatesh and Bala, 2008; Harby et al., 2010; Anderson et al., 2011; Al-Adwan et al., 2013; Alharbi and Drew, 2014).
	3.6. The Effect of Subjective Norm on Behavioural Intention	(Venkatesh and Bala, 2008; Baker et al., 2010).
	3.7. The Effect of Subjective Norm on Perceived Usefulness	(Al-Gahtani, 2003; Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011).
	3.8. The Effect of Subjective Norm on Image	(Venkatesh and Bala, 2008; Baker et al., 2010).
	3.9. The Effect of Image on Perceived Usefulness	(Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011).
	3.10. The Effect of Job Relevance on Perceived Usefulness	(Venkatesh and Bala, 2008); Baker et al. (2010, p. 41); (Alharbi and Drew, 2014).
	3.11. The Effect of Results Demonstrability on Perceived Usefulness	(Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011).
	3.12. The Effect of Computer Self-Efficacy on Perceived Ease of Use	(Venkatesh and Davis, 2000; Anderson et al., 2008; Venkatesh and Bala, 2008; Anderson et al., 2011).
	3.13. The Effect of Perceptions of External Control on Perceived Ease of Use	Venkatesh and Bala (2008).
	3.14. The Effect of Computer Anxiety on Perceived Ease of Use	(Anderson et al., 2008; Venkatesh and Bala, 2008; Anderson et al., 2011).
	3.15. The Effect of Computer Playfulness on Perceived Ease of Use	Venkatesh and Bala (2008).
	3.16. The Effect of Perceived Enjoyment on Perceived Ese of Use	(Venkatesh and Davis, 2000; Anderson et al., 2008; Venkatesh and Bala, 2008; Anderson et al., 2011).
	3.17. The Effect of Objective Usability on Perceived Ease of Use	(Venkatesh, 2000; Venkatesh and Bala, 2008).

	3.18. The Effect of Additional Moderators of Perceived Ease of Use and Perceived Usefulness for the Noor System Users	(Venkatesh, 2000; Yousafzai et al., 2007a, p. 251; Venkatesh and Bala, 2008).
	3.19. The Effect of Perceived Ease of Use and Perceived Usefulness on Behavioural Intention upon Removing Use Behaviour from Technology Acceptance Model 3	(Davis, 1989; Adams et al., 1992; Karahanna et al., 2006) (Rawstorne et al., 1998; Nah et al., 2004; Bagozzi, 2007; Lee and Park, 2008; Wu and Du, 2012, p. 690 & 691; Agudo-Peregrina et al., 2014, p. 304; Hu et al., 2014).
	3.21. Conclusion	(Venkatesh and Bala, 2008; Thomas, 2013).
Chapter 4	4.1. Introduction	(Somekh and Lewin, 2005, p. 346; Mackenzie and Knipe, 2006; Venkatesh et al., 2013, p. 25).
	4.1.1. Research Philosophy/Epistemology	(Lee, 2004, p. 5; Oates, 2006, p. 282; Bryman, 2012; Saunders et al., 2012).
	4.1.2.1. Positivism	(Bryman, 2012, p. 28; Thomas, 2013).
	4.1.2.2. Interpretivism	(Bryman, 2012; Sekaran and Bougine, 2013; Thomas, 2013; Creswell, 2014, p. 8).
	4.2.1. Research Approach	(Myers, 1997; Saunders et al., 2012; Jones, 2015).
	4.2.2. Research Design	Thomas (2013)
	4.3.1. Target Population	Abu-Ghazaleh (2012).
	4.3.2. Sampling frame	Saunders et al. (2012),
	4.3.3. Sampling Technique	(Marshall, 1996; O'Leary, 2004; Khine, 2013).
	4.4. Reliability and Validity of The Questionnaires	(Nunnally, 1978; Dey, 1993, p. 259; Vogelsang et al., 2013, p. 13; Hair et al., 2014).
	4.5. Questionnaire Design	(Barrow, 1999; Sekaran and Bougine, 2013).
	4.8. Development of the Questionnaire	(Teo et al., 2008; Chuttur, 2009; Baker et al., 2010; Al-Gahtani, 2011; Sentosa and Mat, 2012; Cheung and Vogel, 2013; Lee et al., 2013; Mohammad Abu-Dalbouh, 2013; Padilla-Melendez et al., 2013; Sekaran and Bougine, 2013).
	4.9. The Distribution of the Questionnaires	(Smart Survey, 2014).
	4.10.1. Outliers	Tabachnick and Fidell (2013, p. 106).
	4.10.3. Normality Test	(Trochim and Donnelly, 2006; Field, 2009; Khine, 2013; Gravetter and Wallnau, 2014; Hair et al., 2014, p. 573).
	4.10.3.1. Joint Multivariate Kurtosis	Tabachnick and Fidell (2013, p. 108).
	4.10.3.2. Multicollinearity Test	(Hair et al., 2011; Hair et al., 2014, p. 197; Spss, 2015).
	4.10.5. Composite Reliability Testing	(Carmines and Zeller, 1979; Harby et al., 2010; Tabachnick and Fidell, 2013; Colwell, 2016).

	4.10.6. Construct Validity	(Selim, 2003; Hair et al., 2014, p. 606).
	4.10.6.1. Convergent Validity Testing	(Farrell, 2010, p. 324; Korchia, 2010; Hair et al., 2014, p. 632).
	4.10.6.2. Divergent Validity Testing	(Fornell and Larcker, 1981; Farrell, 2010, p. 325; UTEXAS, 2010; Arbuckle, 2014; Hair et al., 2014).
	4.11. Structural Equation Modelling	(Byrne, 2010; Lomax and Schumacker, 2010; Cohen et al., 2011; Khine, 2013)(Mancha and Leung, 2010; Blunch, 2012; Khine, 2013, p. 6; Pallant, 2013; Tabachnick and Fidell, 2013; Hair et al., 2014, p. 565; Kline, 2015).
	4.11.2. Overall Measurement Model Fit	(Wheaton et al., 1977; Bentler and Bonnet, 1980; MacCallum et al., 1996; Hu and Bentler, 1999; Steiger, 2007; Hooper et al., 2008; Venkatesh and Bala, 2008; Lomax and Schumacker, 2010; Hoyle, 2012; Khine, 2013, p. 14; Tabachnick and Fidell, 2013; Hair et al., 2014; Al-Gahtani, 2016).
	4.11.3. Model Improvement	(Bentler and Bonnet, 1980; Jöreskog and Sörbom, 1993; Wang et al., 1996; Dawes et al., 1998; McIntosh, 2006; Ullman, 2006, p. 46; Hair et al., 2010; Tabachnick and Fidell, 2013).
	4.11.4. Comparative fit indices measures for MLE and ADF estimates	(Curran et al., 1996; Wang et al., 1996, p. 236; Schermelleh-Engel et al., 2003).
	4.11.5. The Adjusted fit Indices, the Bollen-Stine p Value, AND RMSEA	Walker and Smith (2016).
	4.11.6. The Maximum Likelihood Estimation	(Tanaka, 1993; Khine, 2013, p. 16; Hair et al., 2014, p. 587),
	4.12. Conclusion	(Nunnally, 1978; Khine, 2013; Hair et al., 2014).
Chapter 5	5.3. Comparative Hypotheses on Groups	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
Chapter 6	6.13. Conclusion	(Wang et al., 1996; Schermelleh-Engel et al., 2003; Venkatesh and Bala, 2008; Al-Gahtani, 2016)
Chapter 7	7.3.2. The Path Diagram on the Teachers' Model Without the Use Behaviour Construct	Hair et al. (2014).
	7.3.4. Path Diagram of the Parents' Model Without the Use Behaviour Construct	Hair et al. (2014).
	7.3.6. Path Diagram on the Students' Model Without the Use Behaviour Construct	Hair et al. (2014).
Chapter 8	8.2. Testing the Appropriateness of the Noor System in the Kingdom of Saudi Arabia Using the	(Wang et al., 1996; Schermelleh-Engel et al., 2003; Venkatesh and Bala, 2008; Al-Gahtani, 2016).

	Technology Acceptance Model 3	
	8.3.1. H1: USE ← BI	(Al-Gahtani, 2008; Venkatesh and Bala, 2008).
	8.3.2. H2: BI ← PU	(Aladwani and Aladwani, 2002; Selim, 2003; Akour et al., 2006; Al-Khateeb, 2007; Al-Gahtani, 2008; Venkatesh and Bala, 2008).
	8.3.3. H3: BI ← PEOU	(Aladwani and Aladwani, 2002; Akour et al., 2006; Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.3.1. H3a: BI ← PEOU *x* EXP	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.4. H4: PU ← PEOU	(Rose and Straub, 1998; Selim, 2003; Al-Gahtani, 2008; Anderson et al., 2008; Venkatesh and Bala, 2008; Harby et al., 2010; Anderson et al., 2011; Al-Adwan et al., 2013; Alharbi and Drew, 2014; Al-Gahtani, 2016).
	8.3.4.1. H4a: PU ← PEOU *x* EXP	(Venkatesh and Bala, 2008).
	8.3.5. H5: BI ← SN	(Venkatesh and Bala, 2008; Baker et al., 2010; Al-Gahtani, 2016).
	8.3.5.1. H5a: BI ← SN *x* EXP	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.5.2. H5b: BI ← SN *x* VOL	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.5.2.1. H5c: BI ← SN *x* VOL (Mandatory setting)	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.5.2.2. H5e: BI ← SN *x* VOL (Voluntary setting)	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.5.3. H5d: BI ← SN *x* VOL *x* EXP (Mandatory setting)	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.5.4. H5f: BI ← SN *x* VOL *x* EXP (Voluntary setting)	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.6. H6: PU ← SN	(Al-Gahtani, 2003; Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011).
	8.3.6.1. H6a: PU ← SN *x* EXP	(Venkatesh and Bala, 2008; Baker et al., 2010; Al-Gahtani, 2016).
	8.3.7. H7: IMG ← SN	(Venkatesh and Bala, 2008; Baker et al., 2010; Al-Gahtani, 2016).
	8.3.8. H8: PU ← IMG	(Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011; Al-Gahtani, 2016).
	8.3.9. H9: PU ← REL	(Venkatesh and Bala, 2008; Baker et al., 2010; Alharbi and Drew, 2014; Al-Gahtani, 2016).
	8.3.9.1. H9a: PU ← REL *x* OQ	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.10. H10: PU ← RES	(Anderson et al., 2008; Venkatesh and Bala, 2008; Baker et al., 2010; Anderson et al., 2011; Al-Gahtani, 2016).

	8.3.11. H11: PEOU ← CES	(Anderson et al., 2008; Venkatesh and Bala, 2008; Anderson et al., 2011; Al-Gahtani, 2016).
	8.3.12. H12: PEOU ← PEC	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.13. H13: PEOU ← ANX	(Anderson et al., 2008; Venkatesh and Bala, 2008; Anderson et al., 2011; Al-Gahtani, 2016).
	8.3.13.1. H13a: PEOU ← ANX *x* EXP	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.14. H15: PEOU ← ENJ	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.3.14.1. H15a: PEOU ← ENJ *x* EXP	(Venkatesh and Bala, 2008; Al-Gahtani, 2016)
	8.4. Exploring the Role that the Demographics Moderators can Play in the Acceptance of The Noor System by Testing the Technology Acceptance Model 3	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.5. Investigating the Influence of Saudi Culture (Subjective Norm) on Behavioural Intention and Perceived Usefulness of the Noor System	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	8.6. Investigating the Effect of Retention or Deletion of Use Behaviour as the Main Dependent Variable in the Technology Acceptance Model 3 Under a Self-Reported System Usage	Bagozzi (2007).
	8.7 Conclusion	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
Chapter 9	9.1. Introduction	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	9.2. Contributions of the Study in Relation to the main Constructs and Determinants in the Technology Acceptance Model 3	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	9.3. Contributions Based on the Proposed Socio-Demographic Variables and Subjective Norm	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
Chapter 10	10.2.1. Testing the Appropriateness of Noor System in the Kingdom	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).

	of Saudi Arabia Using the Technology Acceptance Model 3	
	10.2.4. Investigating the Influence that Saudi Culture has on the Behavioural Intention and Perceived Usefulness to Use the Noor system	(Venkatesh and Bala, 2008; Al-Gahtani, 2016).
	10.2.5. Investigating the Effect of Retention or Deletion of Use Behaviour as the Main Dependent Variable in the Technology Acceptance Model 3 Under a Self-Reported System Usage	Wu and Du (2012).
	10.6.6 Concluding Remarks	Al-Gahtani (2016).

Appendix O

Table 11.73: Summary of objectives based on their respective hypotheses

Objective 1: To test the appropriateness of the Noor system in the Kingdom of Saudi Arabia using the Technology Acceptance Model 3.	H1 to H16
Objective 2: To compare the applicability of Technology Acceptance Model 3 on the Noor system among the organisational users (mandatory) and public/non-organisational users (voluntary) in the Kingdom of Saudi Arabia.	H1 to H16
Objective 3: To explore the role that the demographics moderators can play on the acceptance of the Noor system by testing the Technology Acceptance Model 3.	H17a to H17j
Objective 4: To investigate the influence that the Saudi culture has on the Behavioural Intention and Perceived Usefulness to use the Noor system.	H5, H5a, H5b, H5c, H5d, H5e, H5f, H6 and H6a
Objective 5: To investigate the effect of retention or deletion of Use Behaviour as the main dependent variable in the Technology Acceptance Model 3 under a self-reported system usage.	H18a to H18d, H19a to H19c