INVESTIGATING COMPUTER TECHNOLOGY ACCEPTANCE AND READINESS OF STUDENTS: A CASE STUDY IN NORTHWESTERN NIGERIA

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Abdulmalik Ahmad LAWAN: INVESTIGATING COMPUTER TECHNOLOGY ACCEPTANCE AND READINESS OF STUDENTS: A CASE STUDY IN NORTHWESTERN NIGERIA

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ABSTRACT

As much of the modern approaches to learning in universities are supported by computer technologies, the quality of the educational system often relies on how the technologies are used. Most students only use a portion of the functionality available on their PCs. This might also be influenced by their personality. This study explored the influence of personality on technology acceptance in order to describe computer technology readiness and acceptance of students. The researcher developed a questionnaire by combining the items of the streamlined Technology Readiness Index (TRI 2.0) and an extended Technology Acceptance Model (TAM). This is to figure out the influence of the personality trait dimensions of TRI 2.0 (i.e. Optimism, Innovativeness, Discomfort and Insecurity) on the cognitive dimensions of the extended TAM (i.e. Perceived Ease of Use, Perceived Usefulness and Perceived Access Barriers). The questionnaire was administered to 708 students from 7 public universities located in northwestern Nigeria. The data was analyzed using descriptive statistics and regression analysis. The result revealed that personality traits had significant impact on students' readiness to accept and use computer technologies. Unexpectedly, the distinct positive (Optimism, Innovativeness) and negative (Discomfort, Insecurity) dimensions of TRI 2.0 indicated a positive relationship; implying that students are hesitatingly ready for computer-mediated learning.

The results of this study add empirical data to the relevant field and are expected to help educational technologist, investors, and government decision makers.

Keywords: Technology Readiness Index, TRI 2.0, Extended Technology Acceptance Model, TAM, computer technology, students, university, computer-mediated learning, readiness of students, northwestern Nigeria

ÖZET

Üniversitelerde öğrenim her nekadar da bilgisayar teknolojisi tarafından desteklense de, eğitim sisteminin kalitesi bu teknolojinin nasıl kullanıldığına bağlıdır. Birçok öğrenci, PC üzerinde bulunan ve sadece kendilerini ilgilendiren belirli fonksiyonları kullanırlar. Bu çalışma, şahsiyetin teknolojiyi kabul etme üzerindeki etkisini araştırarak öğrencilerin bilgisayar teknolojisini kabul etmeye hazır olup olmadıklarını araştırmaktadır. Araştırmacı, Technology Readiness Index (TRI 2.0) ve geliştirlmiş Technology Acceptance Model (TAM) kullanarak bir anket geliştirmiştir. Bu şekilde TRI 2.0 (optimistik, yenilikçi, rahatsız ve güvenli olmama) boyutlarının şahsiyetle olan bağıntısı ve geliştirilmiş TAM (algılanmış kullanım kolaylığı, algılanmış kolaylık, ve algılanmış giriş zorlukları) ile olan bağıntısı araştırılmıştır. Anket, Kuzeybatı Nijerya'da 7 devlet üniversitesinde okuyan 708 öğrenciye uygulanmıştır. Elde edilen veriler regresyon ve tanımsal istatistik metodları kullanılarak analiz edilmiştir. Neticeler şunu göstermiştir ki şahsiyetin öğrencilerin bilgisayar teknolojisine hazır olup olmadıkları konusunda büyük etkisi bulunmaktadır. Çalışmanın ilginç sonucu da, TRI 2.0 nin pozitif boyutları (optimistik, yenilikçi) ve negatif boyutları (rahatsız ve güvenli olmama) pozitif bir bağıntı göstermiştir ve bu da öğrencilerin isteksiz olarak bilgisayar-destekli eğitime hazır olduklarını gösteriyor.

Bu çalışmanın neticeleri bu konuya empirik veri katmakta ve eğitim teknolojileri ile çalışanlara, araştırmacılara ve hükümetde karar verenlere yardımcı olacaktır.

Anahtar Kelimeler: Technology Readiness Index, TRI 2.0, Genişletilmiş Teknoloji Kabul Modeli, TAM, bilgisayar teknolojisi, öğrenci, üniversite, bilgisayar-destekli öğrenim, öğrencilerin hazırbulunuşluğu, kuzeybatı Nijerya

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LIST OF ABBREVIATIONS

IT: Information Technologies

IS: Information System

TAM: Technology Acceptance Model

TRI: Technology Readiness Index

TRA: Theory of Reasoned Action

PU: Perceived Usefulness

PEU: Perceived Ease of Use

PAB: Perceived Access Barriers

SPSS: Statistical Package for Social Sciences

CHAPTER 1

INTRODUCTION

In this chapter the statement of the problem, the aim of the study, the importance of the study, limitations, duration and overview of the thesis are explained.

In this contemporary time of ours, computer literacy is unavoidable for any society willing to satisfy the three Rs of education; "Reading, Writing, and Reckoning", computer literacy find its essence in the reckoning (Brian, 2008). Pituch and Lee (2006) defined computer literacy as having sufficient knowledge and skill to be able to use computers; familiar with the operation of computers. Nigerian Government under its federal ministry of education established ICT department. The department is tasked to provide initiatives that will promote computer-mediated learning (i.e. supporting educational system with computer technologies). In that regard, various levels of government have been supplying IT resources for maintaining computer labs in public institutions (Awoleye, Siyanbola, & Oladipo, 2008). With all these efforts, employability of Nigerian graduates remains questionable owing to the fact that there exist a lot of graduates who aren't computer literate (Asuquo & Agboola, 2014; Idaka, 2013).

Oye, Salleh and Iahad (2011) highlighted that to promote computer-mediated learning in Nigerian universities, the current gesture of providing computer technologies and establishing computer labs for students is a good step forward. But investigating factors that hinders students' readiness to accept and effectively utilize computer technologies is equally important. Researches that will investigate students' readiness to adopt and utilize computer technologies in the educational system are what Nigerian government have overlooked.

By and large, previous researches on technology use focus on factors influencing first term adoption of new computer technologies (Awoleye et al., 2008; J. C. Lin & Hsieh, 2006; Park, 2009; Son & Han, 2011; Wang, 2008); despite the fact that uncovering factors influencing the continued use of new technologies is especially more important. By assessing users' attitudes and beliefs about computer technology pre-adoption, post-adoption, and/or sustainable

adoption; behaviors can be implied. This is the solitary strength of researchers that used theoretical models (Son & Han, 2011).

There exist abundant theoretical models that tried to predict and explain the process of adopting computer technologies. The popular Technology Acceptance Model was marked as an essential tool for researchers willing to study user acceptance of an information system.

Researches have alerted that TAM variables of PU and PEU are not sufficient factors in describing all influences toward technology adoption (Bagozzi, 2007; Elise & Donthu, 2006; Lee & Lehto, 2013; Saadé, Nebebe, & Tan, 2007; Venkatesh & Davis, 1996, 2000; Walczuch, Lemmink, & Streukens, 2007). To understand other numerous factors that might also have an influence on technology adoption, various extensions of TAM were proposed (Venkatesh & Davis, 1996; Venkatesh, 2000). The four dimensions of Technology Readiness Index (i.e. Optimism, Innovativeness, Insecurity and Discomfort) are among the recent items associated with TAM in order to describe both psychological and realistic factors that determine the process of technology adoption (Walczuch et al., 2007; Yi, Tung, & Wu, 2003).

1.1 The Problem

Just as in many African countries, in northwestern Nigeria students are having lesson just as when there were no computers. To Nigerian students, computer-mediated learning is sought as one giant ladder that when stabilized educational backwardness might vanish and sustainable education could be established. The government forecasts on technological advancements and always budget high on technology; as for a big dream need a big budget.

While Nigeria is running towards computer-mediated learning, other researchers from technologically developed countries have the view that Technology has failed to sustain educational expectations; one of the reasons is that technology breeds content masters, not learning masters. In others words, technology treats teachers as coaches and make students rely mainly on outside sources not solely on knowledge from their heads (Collins & Halverson, 2010). To achieve sustainable computer-mediated learning, it's vital to clarify

incompatibilities between modern technologies and traditional learning systems, and understand student's attitude toward computer technology.

This research investigated the acceptance and readiness of students on computer technologies. Hence, hinting the possibility of incorporating computer-mediated learning into universities of northwestern Nigeria. It also extended to predict why the impact of government expenditure on supplying computer resources isn't so evident. Based on the research model, the university students' intention to utilize computer technologies for educational practice was investigated.

1.2 Aim of the Study

The aim of this study is to investigate factors affecting students' readiness to use computer technologies in the northwestern region of Nigeria.

1.3 The Importance of the Study

As personality influences technology use, the findings might go beyond exploring perceptions on computer technologies among university students; its implication might support administrative and business sectors connected to IT. Thus, investors and other stakeholders could know the position of their clients in relationship to computers before deciding on or initiating an information system (IS). In academia, simply providing computer training might not be sufficient to ensure techno-readiness, rather adopting strategic means of addressing students' personality concerns is of paramount importance. This strategy will guide instructors on how to adjust training schedules for an ideal use of computer technologies in teaching; for instance, high techno-ready students might be asked to advocate on a new computer technologies while students with high level of techno-insecurity could be asked to design security systems to safeguard certain system from security leaks. As such, each personality trait could yield both positive and negative effects on techno-readiness if not correctly utilized. Thus, understanding and utilizing these personality differences could be advantageous to stakeholders.

1.4 Limitations of the Study

The sample for this research was taken from one region (the northwestern Nigeria) and thus deals with only one out of the six geo-political zones of Nigeria. This might make the results less generalizable to other regions of Nigeria let alone other countries. Also, the use of computer technologies may have had an impact: a more techno-ready society might show different results especially for the positive dimensions adopted in this research model. Another mild consideration is that TAM was proposed to deal with one particular technology while this study was for the general computer technologies. By widening the horizon of TAM, instead, of the usual specification, and it's not possible to draw a perfect mindset from the responses. Students' self-biases while answering the questionnaire is another limitation.

1.5 Duration and Resources

This study started in November 2014 after deciding on the research topic and was completed in January 2016. The work was carried out during this period and its weekly duration is given in Table 1. The thesis presentation, preparation of some of the data collection tools, and getting more acquainted with the statistical tools were done within the same period of time. Some of the expenses incurred during this research were financed by the researcher.

Table 1: Time schedule of the thesis

WORK DONE	DURATION
• Literature Search	2014-2016
• Preparation of the Research Proposal	12 weeks
• Preparation of Data Collection Tools	5 weeks
• Data Collection	3 weeks
• Data Entry	2 weeks
• Data Quality inspections	1 week
• Data Analysis, Interpretation and Discussion	6 weeks
• Writing the Thesis	12 weeks
• Reading, discussion, and correction of the thesis based on the feedback of the supervisor	8 weeks

1.6 Overview of the Thesis

Overall, the thesis comprises of six chapters:

Chapter 1 is the introductory part of the thesis; it explains arising problems that necessitated the study, highlighted importance of the study, limitations and main aim of the study.

Chapter 2 provides the theoretical framework adopted in this research; it explained the background of the two main theoretical items used during data collection stage.

Chapter 3 explains related researches that also followed a similar approach; it updates readers on the past researches that used theoretical models to describe people attitude toward computer technologies in education.

Chapter 4 describes the methodology used in data collection, data analysis, and thesis writing.

Chapter 5 provides a detailed explanation of the results obtained and it also discussed the results.

Chapter 6 concludes the thesis and also recommend possible suggestions for future researches.

CHAPTER 2

THEORETICAL FRAMEWORK

This chapter provides an explanation of the items considered in conducting this research; including origin, evolution as well as examplary applications of the items. It describes two functions of computer technologies considered in this research and the impetus behind this empirical approach.

2.1 Computer Technologies Considered in the Study

Son and Han (2011) highlighted that functions of computer technologies fall into two broad categories; basic functions and innovative functions. Basic functions are usually less complex and do not require much knowledge of computer operation, for instance voice communication. While innovative functions such as mobile banking or stock trading require higher security and privacy. Users with high level of discomfort in computer operations are more likely to prefer basic functions. Conversely, users with high level of optimism and innovativeness on computers; who exhibit novelty openness and seeking to new technologies, do feel relative not troubled in utilizing innovative functions.

Sahin (2006) highlighted that innovative functions are available and easily accessible in developed countries more than in developing countries. Users in developed countries possesses less intention to use basic functions viewing them as ordinary services. Sahin also stated that researches on technology adoption in developing countries depicts unclear influence of negative scales of TRI. This is because basic functions have no direct relation to security concerns.

In this research, general features of the computer technologies are considered alongside both negative and positive scales of the research model. Thus, the outcome of this research might reflect a tilted effect compared to relevant researches conducted in developed countries.

The study might warrant that, based on users' personality, stakeholders/managers can strategically stimulate optimistic users towards new computer technologies. Laggards can equally be examined and positioned into advanced technologies by promoting their feelings on core basic functions.

2.2 Technology Acceptance Model (TAM)

There exist abundant theoretical models that tried to predict and explain the process of adopting a new technology. A clear understanding of the history, applications, extensions, limitations and criticisms about the popular TAM is essential to any researcher willing to study user acceptance of computer technologies.

Chuttur (2009) highlighted that in 70's there was growing technological advancements and due to persistent failures in system adoption by organizations, there was rising demand for researches that could explain system use. Davis (1985) conceptualized TAM by citing system features and capabilities as motivators for actual use of the system as shown in the table below:

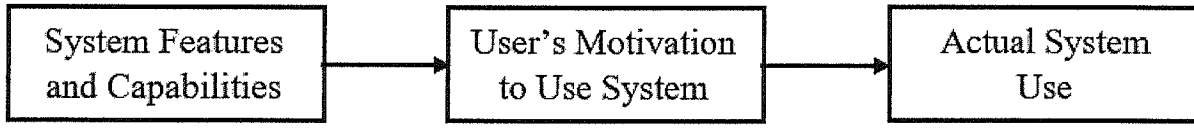


Figure 1: Conceptual TAM

After refinement of the conceptual model, Davis came up with three factors (i.e. PU, PEU, and Attitude) that lead to actual system use. These factors are influenced by X1, X2, X3(i.e. various designed characteristics of the system). Thus, he proposed TAM as shown in the figure below:

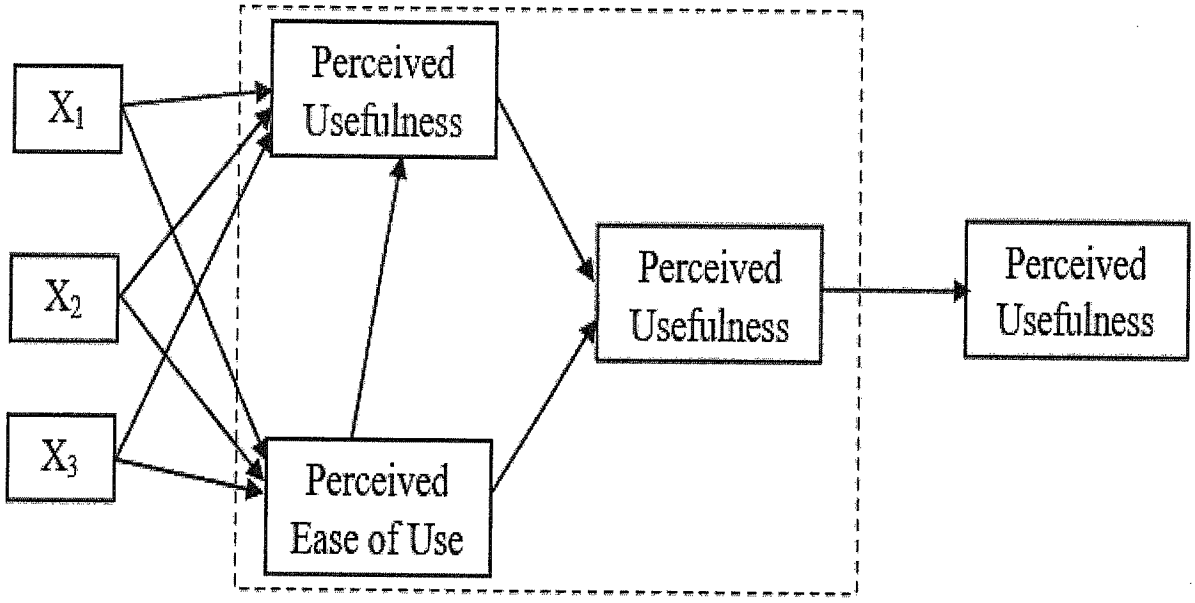


Figure 2: Original TAM suggested by Davis (1986)

These various designed characteristics of the system in TAM gave it additional strength and flexibility. Though some researches marked the easiness and speedy nature of researches with TAM as the cause of distraction from the real solution to problems of technology acceptance (Barki, 2007). Lee, Kozar and Larsen (2003) maintained that; every model is good at explaining something, not everything. TAM isn't the first model to predict user intention as we can see from its genesis.

2.2.1 Evolution of TAM

Chuttur (2009) explained that TAM adopted the causal relationship of 1975 Fishbein's and Ajzen's Theory of Reasoned Action (TRA). The following subsection will briefly look at how TAM was extracted from TRA:

2.2.1.1 Theory of Reasoned Action (TRA)

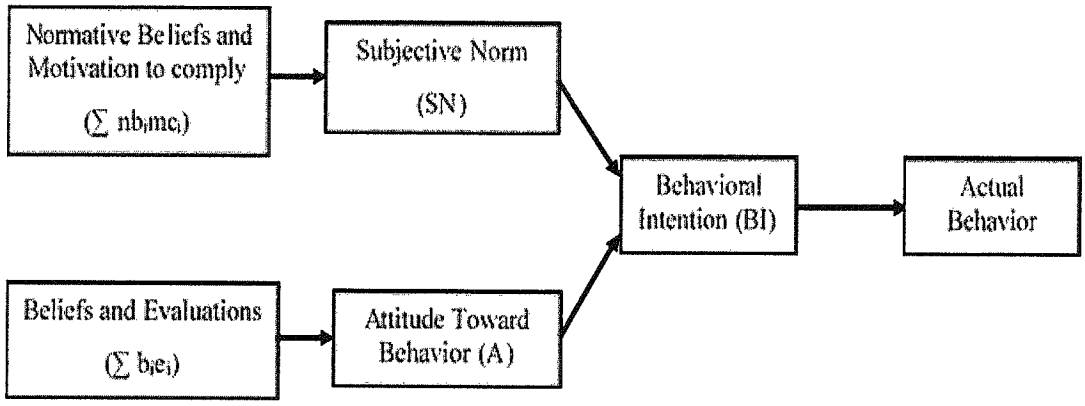


Figure 3: The model of TRA (Chuttur, 2009)

Chuttur (2009) highlighted that TRA is a useful model that could predict and explain the actual behavior of an individual. The Authors of TRA suggested that, by considering person's prior intention along with the beliefs for a given behavior, his or her actual behavior could be determined. They named the measure of person's prior intention to perform a behavior as behavioral intention (**BI**) of a person. And also suggested that the attitude a person has towards actual behavior and his/her subjective norm associated with that behavior could be considered in calculating his/her *BI* as follows:

$$\mathbf{BI=A+SN} \tag{2.1}$$

Where,

A is the attitude; which stands for the positive or negative feeling of a person about performing the actual behavior.

SN is his subjective norm; which stands for the perception that most people who are important to a person thinks he/she should or should not perform the behavior.

All the same, they suggested that A could be determined using the formula:

$$A = \sum(bi \times ei) \tag{2.2}$$

Where,

bi stands for all silent beliefs about consequences of performing a behavior and ***ei*** is the evaluation of those consequences.

SN could be measured using the following formula:

$$SN = \sum(nbi \times mci) \tag{2.3}$$

Where,

nbi is the person's normative beliefs or his perceived expectations of other individuals or groups, and

mci is his or her motivation to comply.

With formulation of TRA, a decade later Davis (1985) considered that a behavior is the actual use of a system, and the theory of reasoned action would be a suitable model to explain and predict a behavior. As a result, he adapted TRA into the framework of user acceptance of an information system. He made two changes to TRA and developed the TAM. Firstly, He suggested that the authors of TRA themselves confessed that ***SN*** was a least understood aspect of TRA and that it had uncertain theoretical status. Thus, in his TAM model, he only considered the attitude of a person towards a given behavior and neglected ***SN*** in predicting the actual behavior of a person. Secondly, as a substitute to several individual silent beliefs to determine the attitude towards a given behavior, (Davis, 1985) relied on several other related studies such as (Bandura, 1982; Swanson, 1982) and identified only two distinct beliefs, PU and PEU, and suggested that PU and PEU are sufficient enough to predict the attitude of a user toward the use of system.

2.2.2 Researches that used PU and PEU before creation of TAM

In the work of Davis (1985), an extensive review was made on prior studies that used PU and PEU while exploring user behavior. Some of the studies as highlighted in the meta-analysis of Tornatzky and Klein (1982) found that PU gives a reliable estimate of the self-predicted use of decision model, and replicated studies confirmed that PU and System Usage are highly correlated (Robey, 1979).

Bandura (1982) stated that any given behavior could best be predicted through self-efficacy and outcome judgment. Fortunately, he defined self-efficacy synonymously to PEU- "judgments of how well one can execute courses of action required to deal with prospective situations". Likewise, he defined outcome judgments synonymous to PU- "the extent to which a behavior once successfully executed is believed to be linked to valued outcomes". Similarly, the research of Swanson (1982) made a similar assertion with PEU as "associated cost of access", and PU as "information quality" and evidently, verified both PEU and PU as vital in determining user behavior.

Davis, Bagozzi and Warshaw (1989) suggested cases in which user might develop strong BI by perceiving system as useful, without forming any attitude. With this suggestion they modified TAM as follows:

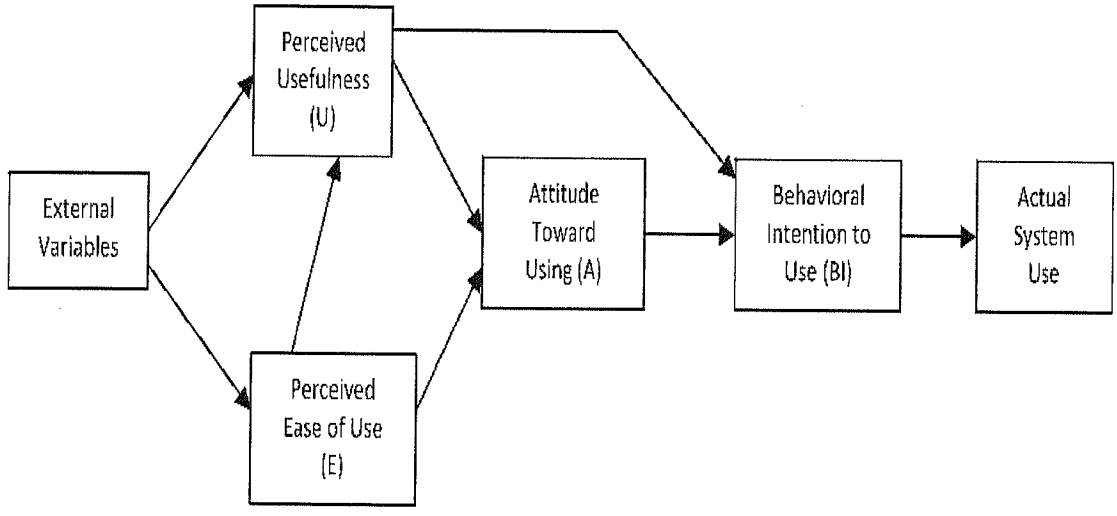


Figure 4: First modified version of TAM (Davis, Bagozzi & Warshaw, 1989)

Subsequently, numerous applications/researches about TAM were conducted in various fields of study (Bagozzi, 2007; Gefen, Karahanna, & Detmar, 2003; Lee et al., 2003; Liu & Yuan, 2005; Park, 2009; Yi et al., 2003). New findings made the original TAM undergo series of transformations. Davis (1993) conducted regression analysis within his model and contrast the presumed insignificant relationship between PU and attitude. He also discovered direct influence between system characteristic and attitude toward using the system. He then formulated these new relationships as shown in the figure below:

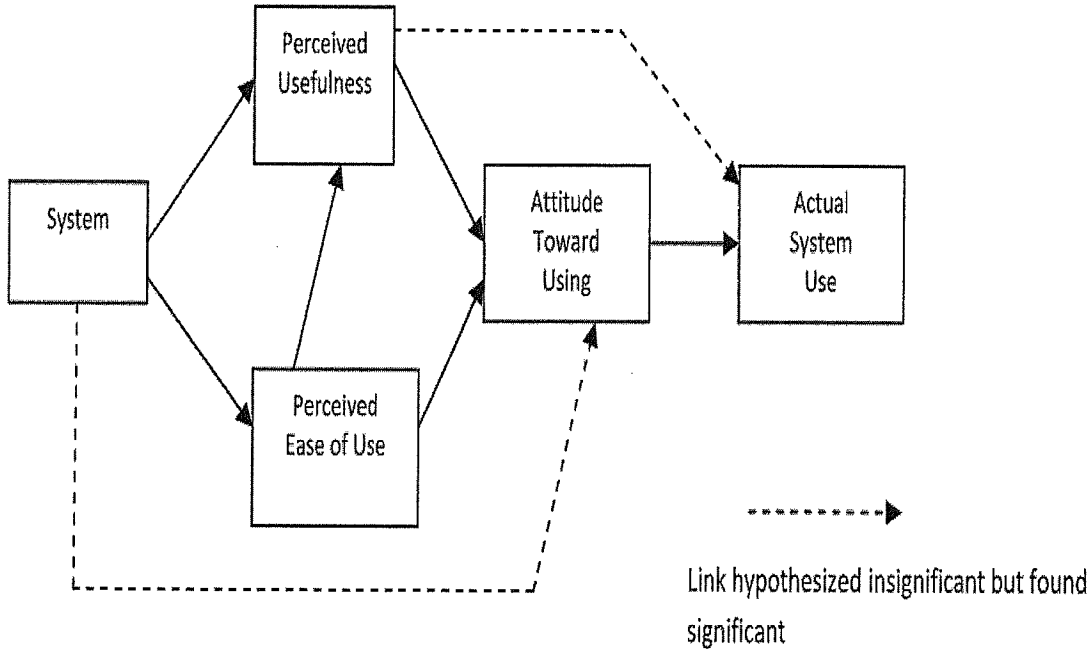


Figure 5: New relationship formulation in TAM (Davis, 1993)

Furthermore, Venkatesh and Davis (1996) conducted a longitudinal study on a fairly used system and they found a direct influence on BI from both PU and PEU. Thus, they eliminate Attitude from the previous model:

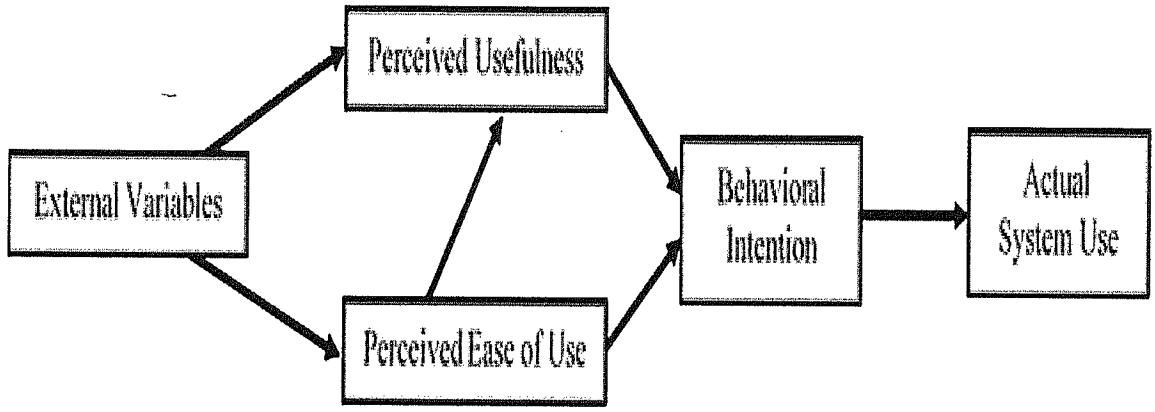


Figure 6: Final version of TAM (Venkatesh & Davis, 1996)

This is one of the closest prototypes of the original model, with attitude replaced by BI and "external variables" overtook the X's. Conversely, external variables might depict other factors that influences person's beliefs toward a system and these variables could provide TAM with additional strength, flexibility and room for further expansions.

With every theory good at explaining something; not everything, Chuttur (2009) suggested that "it is tempting to conclude that researches on TAM may have reached a saturation level, such that future researches should focus on developing new models that would exploit the strengths of the TAM model while discarding its weaknesses".

2.2.3 Weaknesses of TAM

Critics highlighted weaknesses in TAM mainly caused by either the methodology used, TAM variables or foundation of the model.

Supposedly, in the methodology, instead of real actual use data, self-reported data is used in measuring actual system use. However, self-reported data is considered less reliable. Most often, the results of TAM aren't generalizable to real-world owing to the fact that respondents are usually in controlled environments and the two constructs (PU and PEU) have contrasting influences from mandatory to voluntary response settings. In numerous TAM studies, the majority of respondents are students (Cheng, 2011; Ismail et al., 2012; Lee & Lehto, 2013; Liu

& Yuan, 2005; Ong, Lai, & Wang, 2004; Saadé, Nebebe, & Tan, 2007), that might contemplate school management will access their responses. Hence, they might respond while perceiving its consequence on their academic life.

TAM variables of PU and PEU are not sufficient in mediating all influences, rather numerous external factors such as age, experience, and educational level might also have a direct influence on system use.

Bagozzi (2007) highlighted the questionability of the fundamental link between Behavioral Intention and Actual Use. He suggested that there might be a gap within the link, filled with uncertainties and other factors on system adoption. The link is so weak that behavioral intention could not be considered as the terminal goal that leads to actual use, rather BI should be considered as a path to a more fundamental goal. Bagozzi concluded that TAM assumed that people are rational and they planned everything before doing it. While, in reality, people are irrational, and they subjectively reflect and evaluate their decisions in the way they can take a different course of action.

2.2.4 Expansions of TAM

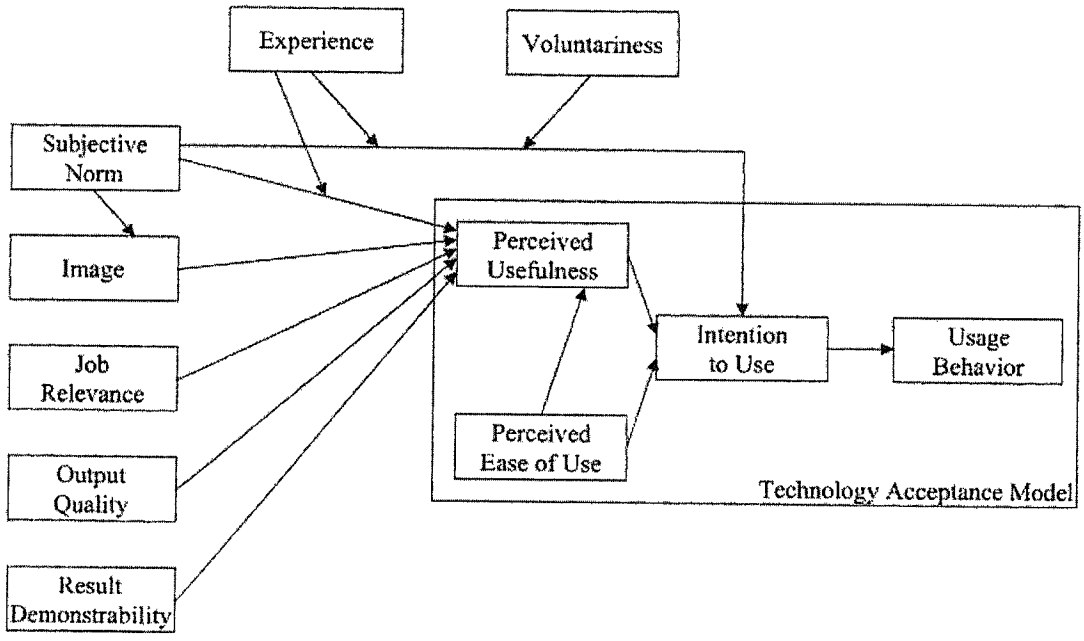


Figure 7: TAM 2 (Venkatesh & Davis, 2000)

To address some of the weaknesses in TAM, Venkatesh and Davis (2000) identified that TAM had some limitations, especially in explaining why people perceive the system as useful. For that reason, they extended it to TAM 2 by adding antecedent variables to perceived usefulness. In order to evaluate the contrasting effects of environmental setting on PU and PEU, they tested the performance of TAM 2 in both voluntary and mandatory settings. The extensions are shown in Figure 7.

Their result has shown that TAM2 is compatible with both voluntary and mandatory settings, except within voluntary setting where the effect of the subjective norm was found to be highly negligible. Similarly, Venkatesh (2000) extended TAM by adding two determinants of PEU as shown in the following figure:

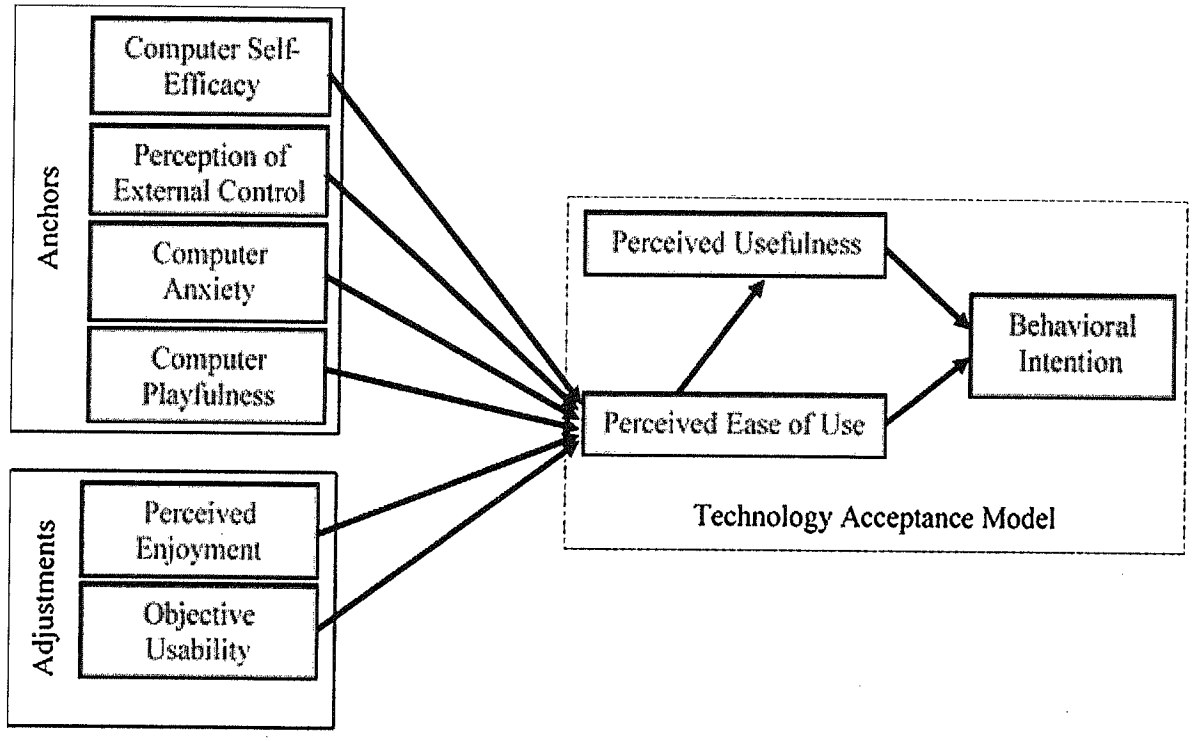


Figure 8: TAM extended with determinants of PEU (Venkatesh, 2000)

Venkatesh (2000) also explained Anchors as general belief about computers and computer usage while Adjustments are beliefs that are shaped by direct experience with the system. His result indicated strong support for the variables as determinants of PEU. These are the two major extensions of TAM on both PU and PEU.

2.2.5 Applications of TAM

TAM was applied under various environmental settings as summarized in

Table 2. Common information systems considered in TAM studies include email, word processor, spreadsheet, hospital IS, database programs etc. The following figure summarized few usage, participants, locations and settings where TAM was proposed:

Table 2: Applications of TAM (Chuttur, 2009)

Variation in TAM application	Examples
Applications	Email, voicemail, fax, dial-up system, e-commerce application, groupware, word processor, spreadsheet, presentation software, database program, case tools, hospital IS, Decision support system, Expert support system, and telemedicine technology.
Country of Study	USA, UK, Taiwan, Hong Kong, Switzerland, Japan, Australia, Turkey, Canada, Kuweit, Nigeria, France, Singapore, China, and Finland
Type	Lab study, Field study and Web surveys

Participants	Students (undergraduate and graduates), knowledge workers, physicians, bank managers, programmer analysts, IT vendor specialists, computer programmers, internet users, brokers, and sales assistants

2.3 Technology Readiness Index (TRI)

Parasuraman (2000) described Technology Readiness (TR) as an indicator of people's disposition to take on and use new technologies. Technology Readiness Index is a multifaceted framework that describe personal beliefs about various aspects of technology in general.

TRI was developed by Parasuraman (2000) and distributed in the Journal of Service Research over 15 years ago. Initially, it was a 36-item scale to quantify individuals' predisposition to grasp and utilize new technology. Since then, due to series of researches in various contexts such as social media, mobile commerce, and cloud computing (Gombachika & Khangamwa, 2012; Muche, 2015; Torrente et al., 2015; Walczuch et al., 2007), conducted at different countries, with several revolutionary technologies, another two-phase research project was conducted to update and streamline the TRI. The streamlined Technology Readiness Index – TRI 2.0 is a 16-item reliable and valid scale with potential applications in the direction of future researches (Parasuraman & Colby, 2014).

Parasuraman and Colby (2014) provided a brief overview of TR and the original TRI, and also highlighted multiple research stages as well as analyses that led to the TRI 2.0. The scale of Technology Readiness Index 2.0 is copyrighted by A. Parasuraman and Rockbridge Associates, Inc., in the year 2014; the scale can only be duplicated with written consent from the authors.

2.3.1 Dimensions of TRI 2.0

Optimism and Innovativeness are indicators that motivate the use of new technology while Discomfort and Insecurity are inhibitors. Parasuraman and Colby (2014) explained the dimensions as follows:

Optimism: A positive belief in improved life control, efficiency, and flexibility due to technology.

Innovativeness: A tendency of being the first among peers to use new technologies.

Discomfort: A sense of being overwhelmed and possessing the need for control.

Insecurity: Disbelieving technology for privacy and security reasons.

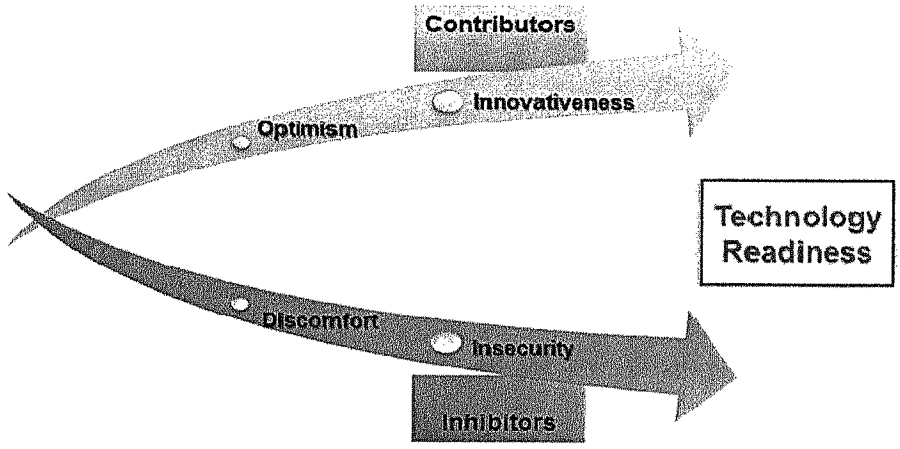


Figure 9: TRI 2.0 showing the motivators and inhibitors dimension (Parasuraman & Colby, 2014)

People possessing high TR levels score high on motivators (i.e. optimism and innovativeness). They feel relaxed using technology and only need a little proof of its performance. While people scoring lower levels are more critical, and feel uncomfortable with new technologies and they ask for help more often. Thus, the stronger an indicator, the better the user fits into

one of the groups and the more significantly s/he is influenced in the use of new high-technology products and services.

Ibrahim and Yusoff (2015) extensively described the negative dimensions of Discomfort and Insecurity which seems to depict another degree of technostress in an individual.

Colby (2014) highlighted that it worth noting that TR is a state of mind, not a degree of competence or knowledge. TR has proven to be a steady characteristic that doesn't change easily for a person. The dimensions are fairly independent of each other, especially the positive and negative dimensions. Therefore, it is possible, surprisingly, for a person to simultaneously have both positive and negative opinions about technology. The degree of technology readiness for an individual is in due course determined by the balance of both positive and negative beliefs, even though the particular combinations around the four dimensions has effects for when and how one adopts a particular technology (Colby, 2014).

2.3.2 Applications of TRI

Parasuraman and Colby (2007) explained that Scholars utilized TRI in numerous studies as an informative variable or as an arbitrator of a behavior, attitude or intention. Papers on this subject have traversed a scope of points, for example, mobile services, banking services, travel, e-government, health services, rural internet adoption, culturally diverse issues (Gombachika & Khangamwa, 2012; Muche, 2015; Walczuch et al., 2007) and so on. Furthermore, TRI gave managers a unique hint to identify the most techno-ready consumers on the adoption of and satisfaction with innovative technology. The relationship between a buyer/intender's score on the TRI scale equally gives understanding in the matter of whether an item or service is genuinely an "innovation" that requires showcasing in an alternate manner than a routine advertisement.

Goodwin (2002) conducted an exploratory study in the Midwest of the United States to assist e-Insurance marketers in deciding on implementation of the internet related research-based foundation. Suitability of TRI to assist in the research was probed based on three inquiries. The inquiries demonstrate the generalizability of TRI to the insurance industry within the constraints identified in the study. The TRI explains almost two-thirds of the explained

variance in agents" self-reported perceptions of technology readiness in their study, and it appears that the positive dimensions of Optimism and Innovativeness are most influential in facilitating technology readiness. They also aimed to better understand how agents form their intentions to adopt and use internet technology. Their finding suggests that general internet models from the services marketing literature appear to generalize to TR research setting, keeping in mind the managerial and research implications of the study.

Muche (2015) conducted a research to determine what motivates nurses to advise physicians on the treatment of diabetic patients with an artificial pancreas. The research focused on readiness to make advice based on the nurses' perceived usefulness of the device. Muche found a significant influence of TRI 2.0's Optimism and Innovativeness on the Perceived usefulness of TAM. Equally, negative relations were recorded against the negative dimension of the TRI 2.0. The suggestion was made on the important insights for marketing theory attached to the study, due to the positive response of the nurses, and recommended further analysis to ascertain the integrity of the composite research model.

Atkinson et al. (2015) conducted a mobile readiness study to investigate why a sample of childbearing women might wish to download an immunization app called ImmunizeCA. Based on demographic details, beliefs, attitudes and information channels with respect to pediatric immunization, they administered a survey to collect self-reported mobile phone usage and address a few purposes behind not immunizing. The mobile-readiness median score of 3.2 was recorded and they found no significant relations between participant age, behavior and attitudes regarding vaccination and mobile readiness scores. They suggested the existence of an opportunity to deliver reliable information on vaccination over mobile devices to better inform the populace, and predictors of individual commitment with these technologies might enable further studies.

CHAPTER 3

RELATED RESEARCH

This chapter explains paradigm of researches on learning with aid of computer technologies. It also clarifies the span of empirical studies that used theoretical models especially the Technology Acceptance Model and Technology Readiness Index.

3.1 Studies on the Concepts of Computer Technologies in Education

Computer technologies are collection of hardware and software components of a computer system that are used by various individuals and organizations in accomplishing various tasks such as information processing, storage and dissemination. Global competitiveness and potentials in computer technologies have made governments put essential regard to the provision of computer-mediated learning systems for public universities, advanced computer-mediated learning is termed as e-learning system (Concannon, Flynn, & Campbell, 2005).

Nigerian federal ministry of education established an e-learning unit with the vision of stimulating IT Education and deployment of computer technologies in learning, teaching, and educational administration, but still most universities are offline. In this regard, quite a lot of such like efforts failed due to barriers such as poorly planned decisions, high cost of technology and quack strategies (Elloumi, 2004; Surry, Ensminger, & Haab, 2005).

Even with the availability of technological infrastructure, it becomes necessary identifying the critical factors that give rise to unacceptance of computer-mediated learning courses, unexpected failures and students' persistent frustration from computer technologies (Hara, Noriko. Kling, 2000; Kilmurray, 2003; Saadé, 2003). Most effective application of computer technologies in learning and root understanding of students' perception and reaction toward elements of computer-mediated learning is crucial (Koohang & Durante, 2003).

Johnson (2015) conducted a comparative study on usage of computer technologies in education. In the study questionnaire was administered to 185 students enrolled in either fully online or on-campus courses. Based on demographic data of the participants, independent samples t-test was applied and the finding revealed that; students that are elderly, native, and have lower desires of scholarly accomplishment mainly enrolled into fully online courses using computer technologies. In the other part, on-campus students indicated the higher need for teacher support, achievement motivation, and social networking.

Tsourela and Roumeliotis (2015) described technology-based services as the effect of the expanding research and development, continuous innovation plans and industrial approach. Based on the unified theory of acceptance and use of technology (UTAUT), they investigated those beliefs that shaped the acceptance and actual use of computer technologies, and the possible variations in terms of technology readiness, age and gender by acting as facilitators. The significant beliefs of performance expectancy, effort expectancy, social influence, and facilitating conditions were hypothesized and tested with empirical data. Such studies offer vital information on the acceptance of computer technologies by stakeholders.

Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) are among the common items used in predicting users' perception on computer technology in education, as well as foreseen its sustainability.

3.2 Related Researches that used TAM

Liu and Yuan (2005) extended TAM with "e-learning materials" as an external variable. They found a strong relationship between e-learning materials and users' intention to use computer technologies. Also, multimedia computer technologies termed as e-learning materials attracted a higher level of user concentration and perceive usefulness. In their study, both usefulness and concentration were regarded as intermediate variables.

Pituch and Lee (2006) demonstrated the importance of user characteristics and system characteristics as external variables that impact perceived usefulness, ease of use, and actual

use of computer technologies for both distance-education and supplementary learning purposes. They also employed the Structural Equation Model technique with LISREL and concluded that system characteristics were more important determinants to perceived usefulness, ease of user, and actual use of a computer technologies in learning. They also stated that their theoretical model based on TAM was justifiably supported.

Saadé, Nebebe, and Tan (2007) conducted a comparative study on university students within multimedia learning setting (i.e. Education Information System for Enhanced Learning). They found TAM a reliable theoretical model in describing the acceptance of computer technologies and suggested that its validity can extend to the context of multimedia and e-learning.

Venkatesh and Davis (1996) extended TAM with self-efficacy as an antecedent of the perceived ease of use. They concluded that self-efficacy influences both pre-adoption and post-adoption perceived ease of use while the objective usability influences ease of use only at post-adoption state.

Park (2009) observed the increasing e-learning opportunities given by higher institutions in Korea and the serious need for researches to check the procedure of how college students embrace and utilize computer technologies while learning. He conducted an empirical study with 628 university students and explain the adoption process using the structural equation modeling technique with the help of the LISREL program. He broadened TAM with the constructs of e-learning self-efficacy and system accessibility and appreciated TAM as a decent theoretical model to understand student's acceptance of computer technologies. E-learning self-efficacy was the most imperative construct, trailed by the subjective norm in explaining the causal procedure in the model.

Ong, Lai and Wang (2004) conducted a survey with 140 engineers from six international companies with the aim of pointing out merits attached to understanding user acceptance of computer-mediated learning before making any huge investment on computer technologies. They extended TAM with perceived credibility. The extension fortified TAM in predicting engineer's intention to use computer technologies in education.

Supposedly, rapid advancements in computer technologies are accompanied by a general increment in sophistication to students. Thus, the adaptation of only one model, for example, the "technology acceptance model", is no more sufficient to predict the planned use of computer technologies in education (Liu, Liao, & Pratt, 2009). They conducted a research using variants of computer technologies on students enrolled into an online part of information system course. They extended TAM with a dimension of "Richer content-presentation" and recorded positive correlations, as well as supported hypotheses under regression analysis on classes of multimedia. Liu recommended a blend of hypotheses or models to be incorporated keeping in mind the end goal to completely catch the many-sided perceptions and beliefs of e-learners.

3.3 Related Researches that used TRI

Abas and Ed (2009) conducted a study to determine the computer-mediated learning readiness in 2,837 largely undergraduate students, at 31 learning centers of the Open University Malaysia. Their study also attempted to determine the extent of possession of computer technologies, and indicators of willingness to possess new computer technologies. They found 63.71 percent of the students to indicate computer-mediated learning readiness above average. They also highlighted findings and implications of their research to the e-learning project at the university.

Van der Rhee et al., (2007) conducted a research that focused on determining the influence of technology readiness and learning-goal on students' affection toward incorporating computer technologies into traditional learning setting. They conducted a large-scale survey to test whether high techno-ready students would predominantly enroll into computer-mediated learning. They found that overall students who are more techno-ready do place higher affection toward computer-mediated learning, but learning-goal orientation does not influence this decision. They also highlighted implications and recommendations for schools that are interested in offering classes equipped with computer technologies.

Wang (2008) conducted an empirical study with 172 subjects. He proposed several models to understand acceptance of computer technologies by considering unaddressed social environmental factors. Wang examined three social environmental factors of normative, mimetic and coercive pressures within the context of computer-mediated learning. He tested the model using partial least square method and found that mimetic and normative pressures to significantly influence the attitude and intention of adopting computer technologies in education while coercive pressures appeared not to. Also, attitude plays a facilitating role between both normative and mimetic institutional pressures and computer technology adoption. His research depicted deeper understanding of the social factors that promote the use of computer technologies in corporate training.

Ho, Kuo and Lin (2010) determined conceptual relationships amongst e-learning system quality, e-learning readiness, and e-learners' competency using structural equation modeling. In the research, 379 participants from 10 high-tech companies in Taiwan were administered questionnaires. They found a significant direct impact of both e-learning system quality and e-learning readiness on e-learners' competency in computer technologies. Additionally, learning outcomes were directly influenced by learners' competency in operating computer technologies.

Antonio et al. (2015) conducted an online survey on 343 employees who had experience in operating computer technologies. They delivered an assessment tool to determine employees' satisfaction and continuous use intention of computer technologies. They combined Technology Readiness Index (TRI) and Decomposed Expectancy Disconfirmation Theory (DEDT). Their results showed positive impact of DERT constructs on innovativeness and optimism.

Panday and Purba (2015) highlighted that how well an information system is made within universities, will rely on the readiness of the participants, particularly lecturers and students. Based on this, they conducted a comparative study to investigate readiness to use computer technologies among a random sample of 260 lecturers and 251 students of XYZ University, Jakarta. They employed descriptive statistics as well as t-test analyses and recorded higher level of techno-readiness in lecturers.

3.4 Related Researches that Combined both TAM and TRI

Dabholkar and Bagozzi (2002) stated that it is practical to consolidate TRI into TAM because of many accompanying reasons. To begin with, both TRI and TAM were proposed to clarify technology acceptance. Second, they are thoughtfully diverse in that TRI represents technology acceptance by means of people's general inclinations while TAM considers cognitive framework to clarify technology acceptance. Along these lines, it is hypothetically proper to coordinate TRI into TAM.

Yi, Tung and Wu (2003) addressed the question on what processes connect individual traits to behavior by examining the effects of technology readiness (TR) within Technology Acceptance Model. They collected data through online survey and found the two dimensions of innovativeness and optimism from TR to insignificantly influence perceive usefulness. They also stated that there exist some hypothetical and experimental explorations that propose the directing impacts of certain components of TRI on conjectured joins inside of TAM. The surviving writing catches just a piece of the space of TRI. They affirmed that, since TRI is as of now the most integrative measure of technology readiness, which has four adroitly variant dimensions, it is both hypothetically and for all intents and purposes significant to explore in one study the directing impacts of the four dimensions on TAM.

CHAPTER 4

METHODOLOGY

This chapter describes the research model, participants, data collection tools and data analysis, and the procedure so as to provide a detailed description of all the activities carried out under each heading.

4.1 Research Model

The main aim of this thesis is to investigate computer technology acceptance and readiness of students. Specifically, it examine the acceptance and readiness of university students in Nigeria based on computer technologies in traditional learning setting. Accordingly, the streamlined Technology Readiness Index (TRI 2.0) and an extended Technology Acceptance Model (TAM) were used in the study's model.

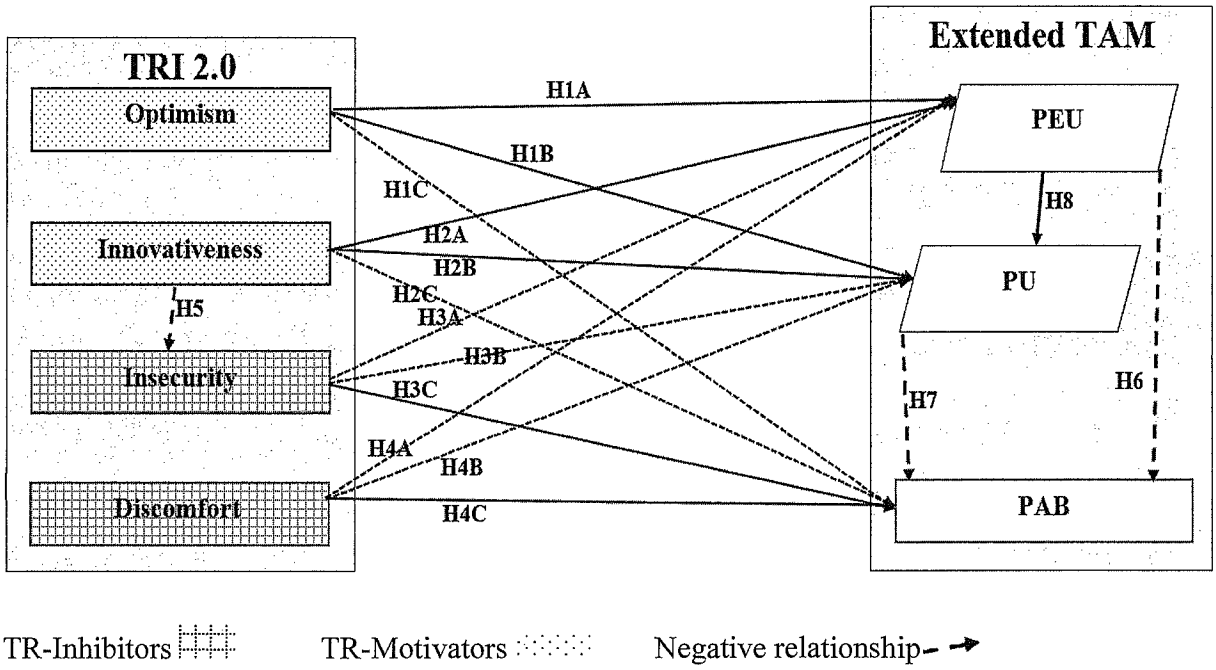


Figure 10: The research model

The composite model was developed by considering series of hypotheses that were viewed from two prospects. The first prospect was powered by the items of TRI 2.0 and the items of the original TAM. The second prospect linked the dimension of Perceived Access Barrier (PAB) with other dimensions within the model. These prospects are pictorially explained in Figure 10. The first prospect was closely related to the approaches in (Lin & Hsieh, 2007; Walczuch et al., 2007). Other approaches relevant to the second prospect include (Elise & Donthu, 2006; Rel, Orillaza, Orillaza, & Barra, 2014; Samah, 2011).

4.1.1 Hypotheses

The main hypothesis of this study is that there exist significant relationships between the dimensions of Technology Readiness and Technology Acceptance Model. In other words, acceptance of a computer technologies lies on the readiness to adopt it. Categorically, the researcher developed the following premises based on the dimensions:

a. Optimism

Optimism is an indicator of person's belief that new technology will provide them with increased control, flexibility, and efficiency in life (Parasuraman 2000), which implies they already have a positive view of new technology before getting introduced to it.

Accordingly, Perceived Usefulness as another indicator of people's intention to acknowledge new technology will also make Optimists consider technology as acceptable.

Optimists generally expect things to go right, tend to anticipate more control in life and consider good returns from technology (Parasuraman & Colby 1997; Lee et al., 1993). They would have the intention to accept new technology with the positive thinking of how useful it might be. Consequently, this optimistic belief magnifies Perceived Usefulness of a new technology and also drive self-confidence in the abilities to grasp the new technology. In the context of computer-mediated learning, Optimist might view computer technologies as tools that add to the superior nature of learning, the opportunity of versatility, more control over day by day scholastic exercises and makes one more beneficial in the academic profession. Thus, the researcher hypothesized the following:

H1A: There is relationship between *optimism* and *perceived ease of use* of a specific technology

H1B: There is a relationship between *optimism* and *perceived usefulness* of a specific technology

H1C: There is a relationship between *optimism* and *perceived access barrier* of a specific technology

b. Innovativeness

People high in innovation imaginativeness have more grounded inborn inspiration to utilize new technologies and appreciate the incitement of attempting new technologies. Arguably, attempting new technologies is associated with great risks in addition to uncertainties but Innovators react with information-seeking and information-processing activities. These reduce their uncertainty about the merits and demerits of a new technology (Agarwal & Prasad, 1998; Sahin, 2006). In connection with computer technologies, Innovators are technology first adopters, autonomous learners, tutors and trend followers. Thus, the researcher hypothesized:

H2A: There is a relationship between *innovativeness* and *perceived ease of use* of a specific technology

H2B: There is a relationship between *innovativeness* and *perceived usefulness* of a specific technology

H2C: There is a relationship between *innovativeness* and *perceived access barrier* of a specific technology

c. Insecurity

People high in the dimension of insecurity need trust in the security of new technologies and require confirmation. They are doubtful about technologies' capacity to work legitimately, just when they trust that they would extraordinarily profit by utilizing new technologies are they willing to taking the danger in doing as such.

By contrasting the benefits of new technologies with privacy and security concern attached, they will render perceived usefulness a lesser affection to them. So also, PEU would be less vital for those with high insecurity level to utilize new advancements. Since they are innately

not certain about new advances, a simple to utilize new innovation might urge them to embrace technology and set up certainty at a later time (Gefen et al., 2003). Insecure people expect that technology occupies individuals, make them excessively hesitant, debilitate relations and individual communication. Consequently, the researcher hypothesized:

H3A: There is a relationship between *insecurity* and *perceived ease of use* of a specific technology

H3B: There is a relationship between *insecurity* and *perceived usefulness* of a specific technology

H3C: There is a relationship between *insecurity* and *perceived access barrier* of a specific technology

d. Discomfort

Individuals who are exceedingly uncomfortable with technologies believe that they are controlled by technologies and that technologies are not intended for conventional individuals (Parasuraman 2000). Moreover, people with low solace utilizing new technologies are connected with generally extraordinary complexities and uncertainties (Yi et al., 2003). When using or dealing with computer technologies, uncomfortable individuals see themselves as inferiors, contemplative people, and moderate learners. Hence, the researcher hypothesized:

H4A: There is a relationship between *discomfort* and *perceived ease of use* of a specific technology

H4B: There is a relationship between *discomfort* and *perceived usefulness* of a specific technology

H4C: There is a relationship between *discomfort* and *perceived access barriers*

e. TR Motivators versus Inhibitors

The Motivators and Inhibitors (i.e. positive and negative) dimensions of TR are fairly independent of each other. Thus, it is possible for an individual to have both positive and negative opinions about technology. The balance between the two distinction effects tells

when and how one adopts a particular technology. Thus, the researcher hypothesized the following:

H5: There exist negative relationship between *TR-Motivators* and *TR-Inhibitors* (i.e. Positive and Negative dimensions of TRI 2.0)

f. Perceived Usefulness, Perceived Ease of Use, and Perceived Access Barriers

People that perceived computer technologies as useful might concurred that computers empower them to achieve certain tasks all the more rapidly, enhances scholastic activities and provide profitability. But inaccessibility due to Perceived Access Barriers might alter the perception of easiness and usefulness attached to new technology. Thus, the researcher hypothesized PU and PEU against the previous assorted TRI 2.0 dimensions plus the following:

H6: *Perceived ease of use* is negatively related to *perceived access barrier*

H7: *Perceived usefulness* is negatively related to *perceived access barrier*

H8: *Perceived ease of use* is related to *Perceived usefulness*

4.2 Participants

The volunteer participants in this study consisted of 708 undergraduate students attending universities of Northwestern Nigeria. Respondents were randomly drawn from various age groups, gender, and academic disciplines. The data collection was mainly conducted in July 2015.

In order to integrate a homogeneous sample, factors were observed for choosing universities, faculties and students. Firstly, the sampled universities operate in the main cities of the same geopolitical region. Secondly, there are a significant number of students from all the universities using computer technologies in academic activities such as student's online registration, assignments etc. Furthermore, in each university, respondents in the sample are

assumed to have at least basic knowledge of computer operation owing to the fact that basic computer operation is a mandatory course during the first study year in the faculties considered. To ensure cautious responses, Questionnaires are administered with the help of teaching staff of individual universities particularly during lectures.

The computer operations offered in these faculties as assumed in this study are both basic and innovative functions; basic functions are based on the simple computer related tasks that aid students' academic processes. While innovative functions of computer involve hi-tech operations that aren't normally learnt at schools.

The study focused on the population of seven universities; among the most populous public universities of the region. The universities are in Kano, Kebbi, Sokoto and Kaduna states located in Northwestern Nigeria. The universities are; Ahmadu Bello University (ABU) Zaria, Bayero University Kano (BUK), Northwest University Kano (NWU), Kano University of Science and Technology (KUST) Wudil, Kaduna State University (KASU), Kebbi State University of Science and Technology Aliero (KSUSTA), Shehu Shagari College of Education (SSCOE) Sokoto. A total count of 708 valid responses are recorded, more detailed information about the participants is shown in Table 3, Table 4, and

Table 5, and

Table 6.

Table 3: Academic level of the respondents

Academic Level	Frequency	Percentages
1st Year	179	25.3
2nd Year	194	27.4
3rd Year	184	26.0
4th Year	151	21.3
Total	708	100.0

Table 3 indicated 25.3% (N=179) of the participants are in their first study year. 27.4% (N=194) are in the 2nd year. 26.0% (N=184) are in their 3rd year. And 21.3% (N=151) are in their 4th year.

Table 4: Gender of respondents

Gender	Frequency	Percentages

Male	357	50.4
Female	351	49.6
Total	708	100.0

In Table 4, out of the total voluntary participants, 50.4% (N=357) are male while 49.6% (N=351) are female.

Table 5: Faculty of respondents

Faculty	Frequency	Percentages
Art	136	19.2
Science	169	23.9
Engineering	142	20.1
Environment	132	18.6
Mathematics & Computing	129	18.2
Total	708	100.0

From

Table 5; 19.2% (N=136) of the respondents are from the faculty of Art. 23.9% (N=169) are from the faculty of Science. 20.1% (N=142) are from the faculty of Engineering. 18.6% (N=132) are from the faculty of Environment. 18.2% (N=129) are from the faculty of Mathematics and Computing.

Table 6: Age group of respondents

Ages	Frequency	Valid Percent
18-22	324	45.8
23-27	234	33.1
28-32	72	10.2
33-37	47	6.6
38-42	13	1.8
Above 42	18	2.5
Total	708	100.0

From

Table 6; 45.8% (N=324) of the respondents are 18-22 years of age, 33.1% (N=234) of the respondents are 23-27 years of age. 10.2% (N=72) of the respondents are 28-32 years of age. 6.6% (N=47) of the respondents are 33-37 years of age while 1.8% (N=13) of the respondents are 38-42 years of age and 2.5% (N=18) of the respondents are above 42 years of age.

4.3 Data Collection Tools

The researcher employed an empirical approach to data collection. The questionnaire used consists of three main parts explained as follows:

4.3.1 Demographic Information

This part constitute personal details about the voluntary respondents. It collected information such as age group, gender, faculty and academic level as mentioned in section 4.2.

4.3.2 Streamlined Technology Readiness Index

Technology readiness index was used in predicting person's psychological beliefs about computer technologies. Parasuraman (2000) unsealed the 36-items TR scale with four dimensions, after which Parasuraman & Colby (2014) upgraded it to the 16-items simplified version. This study constituted the items adopted from the recently streamlined 16-items under the same four dimensions. In this research, Technology Readiness is conceptualized as a stable descriptor of individuals, which is generally not influenced by internal or environmental variables. TRI 2.0 is considerably non-system-specific and might not vary across situations, technologies and vendors. Items in the dimensions are ranked based on five-point Likert scale, with answer choices ranging from "strongly disagree" (1) to "strongly agree" (5). The overall Cronbach's Alpha on the 16 items of TRI 2.0 is 0.793.

The four constructs of TRI 2.0 are divided into positive and negative dimensions toward techno-readiness and they are explained as follows:

- ***Optimism:*** It is a positive dimension of TRI 2.0, it reflects positive belief about technology in general. Belief in increased control, flexibility, and efficiency in life due to technology. Optimism has four items and in this research, it provided a Cronbach's Alpha of 0.823.

- ***Innovativeness:*** this is also a positive dimension of TRI 2.0; It signifies a tendency of been the first to use new technology among peers. Innovativeness has four items and in this research, it provided a Cronbach's Alpha of 0.828.

- ***Insecurity:*** this is a negative dimension of TRI 2.0 and implies suspicion about new technology due to security fears and privacy reasons. Insecurity has four items. In this research, it provided a Cronbach's Alpha of 0.844.

- ***Discomfort:*** it involved having the need for control and a sense of being subjugated by new technology. It is also a negative dimension that has four items. It provided a Cronbach's Alpha of 0.825.

Table 7 summarized the above-mentioned information:

Table 7: Cronbach's Alpha for TRI 2.0

Dimensions	Number of items	Cronbach's Alpha
Optimism	4 items	0.823
Innovativeness	4 items	0.828
Discomfort	4 items	0.825
Insecurity	4 items	0.844
TRI 2.0 overall Cronbach's Alpha = 0.793		

Examining the empirical results revealed that the scales possessed favorable psychometric properties in terms of reliability. All the dimensions indicated a sufficient level of Cronbach's Alpha with values exceeding the 0.70 which conforms to the guideline suggested by (Nunally & Bernstein, 1994).

Table 7 summarized details of the reliability of each dimension. The reliability of the responses are almost steady, in future a better estimate might be recorded when the questionnaire items are translated to the native language of the major respondents (i.e. Hausa language). The current finding might serve as a threshold to future researches.

4.3.3 Extended Technology Acceptance Model (TAM)

This part contained 11 items adopted from an extended TAM; the items are categorized as follows: PU-(6 items), PEU-(3 items) and PAB-(2 items). All the constructs are derived from the literature, primarily from previously tested survey instruments, and are meant to take advantage of well-tested psychometric measures. Most of the constructs were brought into context by carefully modifying previously validated scales to fit the context of computer technologies for learning. Moreover, the scale items for perceived usefulness and perceived ease of use are adopted from Davis (1985). While the scale items for perceived access barriers are adopted from Elise and Donthu (2006). They developed scale which consist of 5 dimensions. In this study the researcher considered the quality of the publication; which is published in the Journal of Business Research indexed by SSCI. The researcher select only PAB because it's an important determinant of technology readiness. The dimensions of the extended TAM are measured based on five-point Likert scale, with answer choices ranging from "strongly disagree" (1) to "strongly agree" (5). The overall Cronbach's Alpha measured under the 11 items of the extended TAM is 0.761. It worth noting that, unlike PU and PEU, PAB is a negative influencing factor toward technology adoption. Both yielded reliability alpha as shown in

Table 8 below:

Table 8: Cronbach's Alpha for the extended TAM

Dimensions	Number of items	Reference	Reliability Alpha
Perceived Usefulness (PU)	6 items	(Davis, 1985)	0.832
Perceived Ease of Use (PEU)	3 items	(Davis, 1985)	0.840
Perceived Access Barriers (PAB)	2 items	(Elise & Donthu, 2006)	0.850
Overall Cronbach's Alpha of the extended TAM = 0.761			

4.4 Data Analysis

This study aimed at investigating students' perceptions of computer technologies used in educational system. In order to avoid overgeneralizations, it focuses on the factors affecting students' intention to use computer technologies in university. The data collected was analyzed using SPSS 20. The analysis aimed at pointing out critical factors affecting students' readiness and acceptance of computer-mediated learning.

Regression analysis was used in estimating relationships amongst the dimensions (i.e. the results of estimating the model) or factors influencing the extended TAM from TRI 2.0 dimensions. Pearson correlation was used in estimating dependencies between the dimensions. Statistical tools of frequency, percentage, mean and standard deviation are also used in describing the results.

4.5 Procedure

After deciding on the suitable research theme, an extensive literature search was conducted. Suitable data collection tool was suggested based on the status of the research location (i.e. universities in northwestern Nigeria). Based on these, two theoretical items namely; TRI 2.0 and extended TAM were chosen and with them questionnaire was prepared. Specifically, a questionnaire containing 27 items was created, verified and printed. The questionnaire was then administered to the voluntary participants (i.e. university students) through their Lecturers in seven universities. A total of 1400 self-administered questionnaires were distributed to the participants, and the number of returned questionnaires were 994. 708 questionnaires were verified as valid, indicating 71.2% valid response rate. The questionnaire (i.e. hard copies) data were inspected and entered into SPSS 20. The empirical data (i.e. soft copies) undergoes series of checks to eliminate data entry errors and ensure data quality. The valid questionnaires were decided by eliminating those with multiple missing values on the response scales, case duplications or multiple empty demographic fields.

The researcher then analyzes the data in SPSS 20 using descriptive statistics and other relevant statistical tools. In other words, the results obtained in the research were analyzed, described, and later interpreted by creating tables using appropriate statistical techniques in the direction of the suggestions of the supervisor and statistical experts.

The Documentation was accomplished after the analysis and series of writing corrections and formatting with the help of the supervisor. With the overall document passing through chapter by chapter reviews and corrections from the supervisor, final feedback was received from the supervisor. The finished up-to-date copy of the document was made ready and formatted in a presentable format for the jury. Suggestions from the jury are implemented. After a positive response, the final copies were printed and distributed for documentation in university and department libraries.

CHAPTER 5

RESULTS AND DISCUSSIONS

This chapter describes the outcome of this research and its interpretation. Descriptive statistics, dependencies and relationships hypothesized within this research are falsified against the results of this chapter.

5.1 Preliminary Results

In order to pick up intuition into the feature of the data,

Table **9** was created, it abridged descriptive statistics of mean and standard deviation.

Table 9: Preliminary descriptive statistics on the items

	Items		Mean	SD
1.	Optimism	New technologies contribute to a better quality of teaching	4.41	0.71
2.		Computer technology gives me more freedom of mobility	4.10	0.75
3.		Computer technology gives people more control over their daily academic activities	4.03	0.76
4.		Computer technology makes me more productive in my academic career	4.07	0.78
5.	Innovativeness	Other people come to me for advice on new computer technologies	3.45	1.03
6.		In general, I am among the first in my circle of friends to acquire new technology when it appears	3.38	1.06
7.		I can usually figure out new high-tech products and services without help from others	3.48	1.09
8.		I keep up with the latest technological developments in my areas of interest	3.54	0.97

9.	Discomfort	When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do	3.43	1.13
10.		Technical support lines are not helpful because they don't explain things in terms I understand	3.07	1.12
11.		Sometimes, I think that technology systems are not designed for use by ordinary people	3.18	1.18
12.		There is no such thing as a manual for a high-tech product or service that's written in plain language	3.20	1.10
13.	Insecurity	People are too dependent on technology to do things for them	3.86	1.08
14.		Too much technology distracts people to a point that is harmful	3.88	1.00
15.		Technology lowers the quality of relationships by reducing personal interaction	3.54	1.17
16.		I do not feel confident teaching with a place that can only be reached online	3.45	1.09
17.	Perceived Usefulness	Computer enables me to accomplish tasks more quickly	4.37	0.78
18.		Using computer improves my academic performance	4.24	0.78
19.		Using computer increases my productivity	4.10	0.82
20.		Using computer enhances my effectiveness on the studies	4.10	0.86
21.		Using computer makes it easier to do my studies	4.23	0.84
22.		Overall, I find computer useful in my studies	4.23	0.84
23.	Perceived Ease of Use	Learning to operate the computer is easy for me I find it cumbersome to use the computer	3.81	0.95
24.		I find it easy to get the computer to do what I want it to do	3.88	0.92
25.		Usage of the computer is clear and understandable	3.95	0.95
26.	Perceived Access Barriers	I do not have the money to get Internet access for personal use	3.27	1.20
27.		I cannot afford the Internet for personal use	3.14	1.22

According to the results above, it can be seen that students have indicated strong responses on both TRI 2.0 and extended TAM scales because all the responses are above average (>3). It is an inevitable truth that the students possess strong perceptions on computer technologies.

The highest mean of the estimates was recorded in the questionnaire for item 1 "*New technologies contribute to a better quality of teaching* (M=4.41)". The importance of knowledge is increasing day by day. So, with such perception, supplying innovative computer technologies might boost the students' perception of improved quality of education. This necessitates incorporating computer related components into the traditional setting. The second highest mean in the estimations was found for item 17 "*Computer enables me to accomplish tasks more quickly (M=4.37)*". It might be an indicator that the variety of functions offered by technologies, both basic and innovative functions utilized by the students do play an important role to their punctuality. Thus, an excellent implementation of modern computer-mediated learning system will definitely re-simplify learning process and foster academic accomplishments. The third highest mean in the estimations was found for item 18 "*Using computer improves my academic performance (M=4.24)*". It might be an indicator that the variety of technologies available to students are reasonably used in academic environments. Thus, improved quality education can be expected by incorporating cutting-age technologies into the present academic environment.

Similarly, the lowest mean was recorded on item 10 "*Technical support lines are not helpful because they don't explain things in terms I understand (M=3.07)*". Obviously unclarified wording from support centers shouldn't be a stronghold for TR, due to the fact that most of the daily technologies used in academic environments aren't much complicated to operate. The second lowest mean was recorded on item 27 "*I cannot afford the Internet for personal use (M=3.14)*". This item involved inquiry about something related to the socio-economic status of the respondents. As such no matter how randomized and confidential a data collection method seems to be, respondents might not expose their financial weaknesses. Another interpretation might describe the low response as the effect of high optimism and other positive perceptions to supersede the cost sensitivity of affording internet for personal use. The third lowest response was recorded on item 11 "*Sometimes, I think that technology systems are not designed for use by ordinary people (M=3.18)*". Supposedly, low responses could be

recorded on this item owing to the fact that most technologies available to students are for basic functions and also aren't too technical. Thus, students of developing countries might perceive technologies available to them as user-friendly.

5.2 Dependencies between the Model Dimensions

This section wishes to explore all possible correlations between the constructs of the research model. The following table depicts construct level statistics and correlation matrix, which summarizes the linear dependence between assorted pair of dimensions:

Table 10: Correlation matrix and construct level statistics

Dimensions	Mean	SD	1	2	3	4	5	6	7
Optimism	4.16	.61	1						
Innovativeness	3.46	.84	.284**	1					
Discomfort	3.22	.92	.066	.208**	1				
Insecurity	3.68	.90	.095*	.077*	.224**	1			
PU	4.22	.60	.429**	.273**	-.062	.047	1		
PEU	3.88	.82	.258**	.295**	.048	.041	.360**	1	
PAB	3.21	1.13	.061	-.021	.168**	.142**	-.022	.087**	1

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

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

Significant correlations existed between all the intersected dimensions with the exception of the following: (*Discomfort* against Optimism, PU and PEU), (*Insecurity* against PU and PEU), (*PAB* against Optimism, Innovativeness and PU). Significant positive correlations existed between all the other intersected dimensions. It implies that in all positive intersections with an increase in one dimension there will be an increase on the other dimension.

The strongest correlation was recorded on Optimism – PU (correlation coefficient=0.429) followed by PEU – PU (correlation coefficient =0.360) in that order. These values indicate high dependence between the pairs. That's to say with a high increase in optimism there will be a high increase in perceived usefulness, and in the same order, with a high level of perceived usefulness, there will be high perceived ease of use of a specific computer component.

From the above correlation matrix, we clearly understood the directions of dependencies by considering the magnitude and signs of the correlation coefficients. Thus, a description of the observed linear dependence between any two assorted dimensions can either be positive or negative (i.e. direct or indirect dependence) and a strong one or weak. However, this isn't enough to falsify the formulated hypotheses, we need to view all possible influencing relationships from the main explanatory dimensions (i.e. Optimism, Innovativeness, Insecurity, and Discomfort) toward the proposed dependent dimensions (i.e. PU, PEU, and PAB), such relations that can be considered in understanding which dimension could significantly predict the other. Hence, the researcher employed regression analysis in the subsequent section.

5.3 Relationship between the Dimensions of TRI 2.0 and Extended TAM

Linear Regression Analysis was applied in estimating the model results as categorically explained within the subsequent subsections.

5.3.1 Influence of Optimism on Extended TAM

The researcher built relevant hypotheses based on the assumptions that; Optimism will serve as an indicator of students' belief that new technology will provide them with increased performance, due to their predetermined positive perception on computer technology. Optimistic students anticipate no fear and view computer technologies as tools that add value to scholastic activities. Other positive indicators within the model will also make Optimists not to reject new technologies. The following findings tend to falsify these assumptions:

5.3.1.1 There is a relationship between *optimism* and *perceived ease of use* of a specific technology

Considering the coefficients from Table 11 ($F(1, 706) = 50.295$; $p<.05$; $R^2=.067$); the overall regression model was significant. $R^2 = 0.067$ denoted that optimism accounts for 6.7% of the variance in Perceived Ease of Use. ($p<0.05$), indicated that "optimism" had a significant positive influence on "ease of use". Thus, H1A is supported.

Table 11: Relationship between optimism and perceived ease of use

Dependent Variable: Perceived Ease of Use						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.434	.206		11.823	.000	
Optimism	.348	.049	.258	7.092	.000	
Model F	50.295					Supported
R^2	.067					
$p<0.05$						

This shows that the personality trait of optimism has a strong impact on perceived ease of use of computer technologies. Improving the optimistic belief in students will make a higher influence in adopting computer-mediated learning by making them perceive computers as easy to use. A similar result was recorded by Walczuch, Lemmink, & Streukens, (2007).

5.3.1.2 There is a relationship between *optimism* and *perceived usefulness* of a specific technology

Considering the coefficients from Table 12 ($F(1, 706) = 159.172$; $p<.05$; $R^2=0.184$); the overall regression model was significant. $R^2 = 0.184$ denoted that optimism accounts for 18.4% of the variance in usefulness. ($p<0.05$), indicated that "optimism" had a significant positive influence on "usefulness". Thus, H1B is supported.

Table 12: Relationship between optimism and perceived usefulness

	Dependent Variable: Perceived Usefulness					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.440	.142		17.196	.000	Supported
Optimism	.426	.034	.429	12.616	.000	
Model F	159.172					
R^2	0.184					
$p<0.05$						

This shows that the personality trait of optimism has a strong impact on perceived usefulness of computer technologies. Improving the optimistic belief in students will make a higher influence in adopting computer-mediated learning by making them consider more useful features of computers in learning. Dissimilar results were recorded by Yi, Tung, & Wu, (2003).

5.3.1.3 There is a relationship between *optimism* and *perceived access barrier* of a specific technology

Considering the coefficients from Table 13 ($F(1, 706) = 2.665$; $p>.05$; $R^2=.004$); the overall regression model isn't significant. $R^2 =.004$ denoted that optimism accounts for only 0.4% of the variance in perceived access barrier. ($p>0.05$), implies that "optimism" had no significant influence on "perceived access barrier".

Table 13: Relationship between optimism and perceived access barrier

	Dependent Variable: Perceived Access Barriers					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.730	.294		9.285	.000	Not supported
Optimism	.114	.070	.061	1.632	.103	

Model F	2.665
R^2	.004
p>0.05	

This result indicated that optimistic belief does not significantly alter the feeling of access barriers in students.

5.3.2 Influence of Innovativeness on Extended TAM

Customarily, some people do have a positive perception on almost every aspect of computer technology. This isn't preferable when building a sustainable computer-mediated learning system. Those who can quickly utilize new computer technologies and appreciate the incitement of attempting new technologies are in better position to tell more about its implication due to their grounded knowledge about it. Students with innovative imaginativeness are information-seekers. This reduces their uncertainty about the merits and demerits of a new technology (Agarwal & Prasad, 1998; Sahin, 2006). The following findings will strive to identify what cognitive view do innovative students have on computer technologies in learning:

5.3.2.1 There is a relationship between *innovativeness* and *perceived ease of use*

Considering the coefficients from

Table 14 ($F(1, 706) = 67.169$; $p<.05$; $R^2=.087$); the overall regression model was significant. $R^2 = .087$ denoted that innovativeness accounts for 8.7% of the variance in perceived ease of use. ($p<0.05$), indicated that "innovativeness" had a significant positive influence on "perceived ease of use". Thus, H2A is supported.

Table 14: Relationship between innovativeness and perceived ease of use

Dependent Variable: Perceived Ease of Use

	B	Std. Error	β	t	p	Decision
(Constant)	2.891	.124		23.290	.000	
Innovativeness	.286	.035	.295	8.196	.000	Supported
Model F	67.169					
R^2	.087					
$p<0.05$						

This indicated that the personality trait of innovativeness had a strong influence on perceived ease of use of computer technologies. Improving the innovativeness traits in students will make a higher impact in adopting computer-mediated learning by making them acquire more information on innovative technologies for learning. A similar result was recorded by Walczuch et al. (2007).

5.3.2.2 There is a relationship between innovativeness and perceived usefulness of a specific technology

Considering the coefficients from Table 15 ($F(1, 706) = 56.961$; $p<.05$; $R^2=.075$); the overall regression model was significant. $R^2 = .075$ denoted that innovativeness accounts for 7.5% of the variance in perceived usefulness. The coefficient ($p<0.05$), indicated that "innovativeness" had a significant positive influence on "perceived usefulness". Thus, H2B is supported.

Table 15: Relationship between innovativeness and perceived usefulness

Dependent Variable: Perceived Usefulness						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	3.536	.092		38.393	.000	
Innovativeness	.195	.026	.273	7.547	.000	Supported
Model F	56.961					
R^2	.075					
$p<0.05$						

This shows that the personality trait of innovativeness has a strong impact on perceived usefulness of computer technologies. Improving the trait of innovativeness in students will make a higher impact in students' rate of adopting computer-mediated learning system. Walczuch et al., (2007) recorded a similar result.

5.3.2.3 There is a relationship between innovativeness and perceived access barrier of a specific technology

Considering the coefficients from Table 16 (F (1, 706) = .326; p>.05; R2=.000); the overall regression model isn't significant. R2 =.000 denoted that innovativeness accounts for 0.00% of the variance in perceived access barrier. The coefficient (p>0.05), indicated that "innovativeness" had no significant influence on "perceived access barrier". Thus, H2C is not supported.

Table 16: Relationship between innovativeness and perceived access barrier

Dependent Variable: Perceived Access Barrier						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	3.304	.180		18.409	.000	
Innovativeness	-.029	.050	-.021	-.571	.568	Not supported
Model F	.326					
R^2	.000					
p>0.05						

This indicated that innovative belief does not alter the feeling of access barriers in students.

5.3.3 Influence of Insecurity on Extended TAM

Students that are doubtful about the positive impact of technologies due reject it unless they trust that they would extraordinarily profit by utilizing it. They have lesser affection toward

positive perceptions. To understand to what extent do technologically insecure students might reject computer-mediated learning, the following findings are considered:

5.3.3.1 There is a relationship between *insecurity* and *perceived ease of use* of a specific technology

Considering the coefficients from

Table 17 ($F(1, 706) = 1.194$; $p>.05$; $R^2=.002$); the overall regression model isn't significant. $R^2 = .002$ denoted that insecurity accounts for only 0.2% of the variance in perceived ease of use. The coefficient ($p>0.05$), indicated that "insecurity" had no significant influence on "perceived ease of use". Thus, H3A is not supported.

Table 17: Relationship between insecurity and perceived ease of use

	Dependent Variable: Perceived Ease of Use					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	3.742	.130		28.801	.000	
Insecurity	.037	.034	.041	1.093	.275	Not supported
Model F	1.194					
R^2	.002					
p>0.05						

This indicated that trait of insecurity does not alter the perceived ease of using computers in students. It reflects that feeling of insecurity isn't enough to bar students from viewing computers as easy to use. The dissimilar result was recorded in (Walczuch et al., 2007). While the similar result was found in (Yi et al., 2003).

5.3.3.2 There is a relationship between *insecurity* and *perceived usefulness* of a specific technology

Considering the coefficients from Table 18 ($F(1, 706) = 1.576$; $p>.05$; $R^2=.002$); the overall regression model isn't significant. $R^2 = .002$ denoted that insecurity accounts for only 0.2% of

the variance in perceived usefulness. The coefficient (p>0.05), indicated that "insecurity" had no significant influence on "perceived usefulness". Thus, H3B is not supported.

Table 18: Relationship between insecurity and perceived usefulness

Dependent Variable: Perceived Usefulness						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	4.095	.096		42.776	.000	Not supported
Insecurity	.032	.025	.047	1.255	.210	
Model F	1.576					
R^2	.002					
p>0.05						

This indicated that trait of insecurity does not alter the perceived usefulness of computers technology in learning. It signal that feeling of insecurity isn't enough to bar students from viewing computers as useful. The dissimilar result was recorded in (Walczuch et al. 2007 and Yi et al. 2003).

5.3.3.3 There is a relationship between *insecurity* and *perceived access barrier* of a specific technology

Considering the coefficients from Table 19 (F (1, 706) = 14.463; p<.05; R^2=.020); the overall regression model was significant. R^2 = .020 denoted that insecurity accounts for 2.0% of the variance in perceived access barrier. The coefficient (p<0.05), indicated that "insecurity" had a significant positive influence on "perceived access barrier". Thus, H3C is supported.

Table 19: Relationship between insecurity and perceived access barrier

Dependent Variable: Perceived Access Barrier						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.547	.178		14.320	.000	Supported
Insecurity	.178	.047	.142	3.803	.000	

Model F	14.463
R^2	.020
$p<0.05$	

This shows that the personality trait of insecurity has a strong impact on access barrier attached to computer technologies. Reducing the trait of insecurity from students will make a higher influence in adopting computer-mediated learning by making them perceive computers as risk-free devices.

5.3.4 Influence of Discomfort on Extended TAM

Another factor that make Students reject computer technologies is the avoidance of getting overwhelmed. Expectedly, those with low confidence in working with computers anticipates extraordinary complexities and uncertainties in new technology. This perception will diminish their chances of accepting new computer technologies. The following results might falsify the hypothesized expectation:

5.3.4.1 There is a relationship between *discomfort* and *perceived ease of use* of a specific technology

Considering the coefficients from Table 20 ($F(1, 706) = 1.647$; $p>.05$; $R^2=.002$); the overall regression model wasn't significant. $R^2 =.002$ denoted that discomfort accounts for only 0.2% of the variance in perceived ease of use. The coefficient ($p>0.05$), indicated that "discomfort" had no significant influence on "perceived ease of use". Thus, H4A is not supported.

Table 20: Relationship between discomfort and perceived ease of use

	Dependent Variable: Perceived Ease of Use					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	3.741	.112		33.378	.000	Not supported
Discomfort	.043	.033	.048	1.284	.200	

Model F	1.647
R^2	.002
p>0.05	

A similar result was recorded in (Walczuch et al., 2007). This indicated that they exist no considerable relation between discomfort and ease of use.

5.3.4.2 There is a relationship between *discomfort* and *perceived usefulness* of a specific technology

Considering the coefficients from

Table **21** (F (1, 706) = 2.715; p>.05; R^2=.004); the overall regression model wasn't significant. R^2 =.004 denoted that discomfort accounts for only 0.4% of the variance in perceived usefulness. The coefficient (p>0.05), indicated that "discomfort" had no significant influence on "perceived usefulness". Thus, H4B is supported.

Table 21: Relationship between discomfort and perceived usefulness

Dependent Variable: Perceived Usefulness						
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	4.342	.083		52.601	.000	
Discomfort	-.041	.025	-.062	-1.648	.100	Not supported
Model F	2.715					
R^2	.004					
p>0.05						

A similar result was recorded in (Walczuch et al., 2007). This indicated that they exist no considerable relationship between discomfort and perceived usefulness.

5.3.4.3 There is a relationship between *discomfort* and *perceived access barriers*

Considering the coefficients from

Table 22 ($F(1, 706) = 20.463$; $p<.05$; $R^2=.028$); the overall regression model was significant. $R^2 = .028$ denoted that discomfort account for 2.8% of the variance in perceived access barrier. The coefficient ($p<0.05$), indicated that "discomfort" had a significant positive influence on "perceived access barrier". Thus, H4C is supported.

Table 22: Relationship between discomfort and perceived access barriers

	Dependent Variable: Perceived Access Barrier					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.540	.153		16.610	.000	
Discomfort	.207	.046	.168	4.524	.000	Supported
Model F	20.463					
R^2	.028					
$p<0.05$						

This shows that the personality trait of discomfort attached to computer technologies has a strong impact on perceived access barrier from the technologies. Addressing the trait of discomfort in students will make a higher influence in making students consider no barrier toward adopting computer technologies in their scholastic exercises.

5.4 Influence of TR-Motivators on TR-Inhibitors

The positive and negative dimensions of TRI 2.0 are said to be fairly independent of each other; entailing the possibility of an individual to have both positive and negative opinions about technology. But the balance between the two distinct effects tells when and how one

adopts a particular technology. The following result will site the participants' impetus behind adopting computer technology considering accompanying effects:

Table 23: Influence of TR-Motivators on TR-Inhibitors

	Dependent Variable: TR-Inhibitors					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.596	.173		15.016	.000	
TR-Motivators	.225	.045	.185	5.009	.000	H5 Not supported
Model F	25.092					
R^2	.034					
$p<0.05$						

Considering the coefficients from Table 23 ($F(1, 706) = 25.092$; $p<.05$; $R^2=.034$); the overall regression model wasn't significant. $R^2 = .034$ denoted that *TR-Motivators* account for 3.4% of the variance in *TR-Inhibitors*. The value ($p<0.05$), clearly indicate that the motivators of TR (i.e. optimism and innovativeness) collectively had a significant positive influence on the Inhibitors of TR (insecurity and discomfort). In other words, the result showed a significant positive relationship contrary to the hypothesized direction. Therefore, the hypothesis H5 "There exist a negative relationship between *TR-Motivators* and *TR-Inhibitors* (i.e. Positive and Negative dimensions of TRI 2.0)" is not supported. This re-explore the assertion made by Colby, (2014) that both *TR-Motivators* and *TR-Inhibitors* are fairly independent of one another.

5.5 Influence of Perceived Ease of Use on Perceived Access Barriers

The researcher assumed that Students who perceived computer technologies as helpful may agree that computers enable them to accomplish certain tasks more quickly, and improves academic exercises. But the unavailability of computer technologies might adjust Students'

perception of easiness associated with the technologies. The following finding might falsify the researcher's assumption:

Table 24: Influence of perceived ease of use on perceived access barriers

	Dependent Variable: Perceived Access Barrier					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	2.737	.205		13.323	.000	
PEU	.121	.052	.087	2.327	.020	H6 not supported
Model F	5.413					
R^2	.008					
P<0.05						

Considering the coefficients from

Table 24 (F (1, 706) = 5.413; p<.05; R^2=.008); the overall regression model is significant. R^2 =.008 denoted that perceived ease of use accounts for only 0.8% of the variance in perceived access barrier. The coefficient (p<0.05), indicated that "perceived ease of use" had a significant positive influence on "perceived access barrier". This is opposite to the hypothesized direction; hypothesis H6 "*Perceived ease of use* is negatively related to *perceived access barrier*". Thus, H6 is not supported. This indicated that perceived ease of use does increase the feeling of access barriers in students. Opposite result was recorded by Elise and Donthu (2006).

5.6 Influence of Perceived Usefulness on Perceived Access Barriers

The researcher projected that, Students that view computer technologies as highly useful might turn away access barriers at all cost. This grounded the hypothesis H7 "*Perceived usefulness* is negatively related to *perceived access barrier*"; which was tested against the following result:

Table 25: Influence of perceived usefulness on perceived access barriers

	Dependent Variable: Perceived Access Barrier					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**
(Constant)	3.381	.300		11.265	.000	Not supported
PU	-.042	.071	-.022	-.594	.552	
Model F	.353					
R^2	.001					
p>0.05						

The hypothesis H7 was not supported by considering the coefficients from

Table 25 ($F(1, 706) = .353$; $p>.05$; $R^2=.001$); the overall regression model wasn't significant. $R^2 =.001$ denoted that perceived usefulness account for only 0.1% of the variance in perceived access barrier. ($p>0.05$), indicated that "perceived usefulness" had no significant influence on "perceived access barrier". Although, the relation is negative ($\beta=-0.022$), but it is not significant. This indicated that perceived usefulness does not have any significant influence on the feeling of access barriers in students.

5.7 Influence of Perceived Ease of Use on Perceived Usefulness

The researcher projected that perception of easy to use is associated with the feeling of usefulness attached to computer technologies. This grounded the hypothesis H8 "*Perceived ease of use* is related to *Perceived usefulness*"; this is tested against the following result:

Table 26: Influence of perceived ease of use on perceived usefulness

	Dependent Variable: perceived usefulness					
	B	**Std. Error**	**β**	**t**	**p**	**Decision**

(Constant)	3.183	.103		31.019	.000	
PEU	.265	.026	.360	10.241	.000	Supported
Model F	104.882					
R^2	.129					
P<0.05						

The hypothesis H8 was supported by considering the coefficients in Table 26 (F (1, 706) = 104.882; p<.05; R^2=.129); the overall regression model was significant. R^2 = 0.129 denoted that perceived ease of use accounts for 12.9% of the variance in perceived usefulness. The coefficient (p<0.05), indicated that "perceived ease of use" had significant positive influence on "perceived usefulness".

This shows that the perceived ease of use attached to computer technologies immensely influence perceived usefulness of the technologies. When students acquire the hands-on skills in computer operations, higher influence in adopting computer-mediated learning will be recorded due to increased view of usefulness attached to computers. A similar result was recorded by Elise & Donthu (2006) and Walczuch et al. (2007).

5.8 Summarized Decisions

Table 27 provided a complete list of the hypotheses, their corresponding estimates from the model and the summarized decisions based on the results. The β coefficients are the standardized results of the regression analysis that warrant the variances between the contrasting dimensions to be 1.

Table 27: Summary of hypotheses and decisions of the study

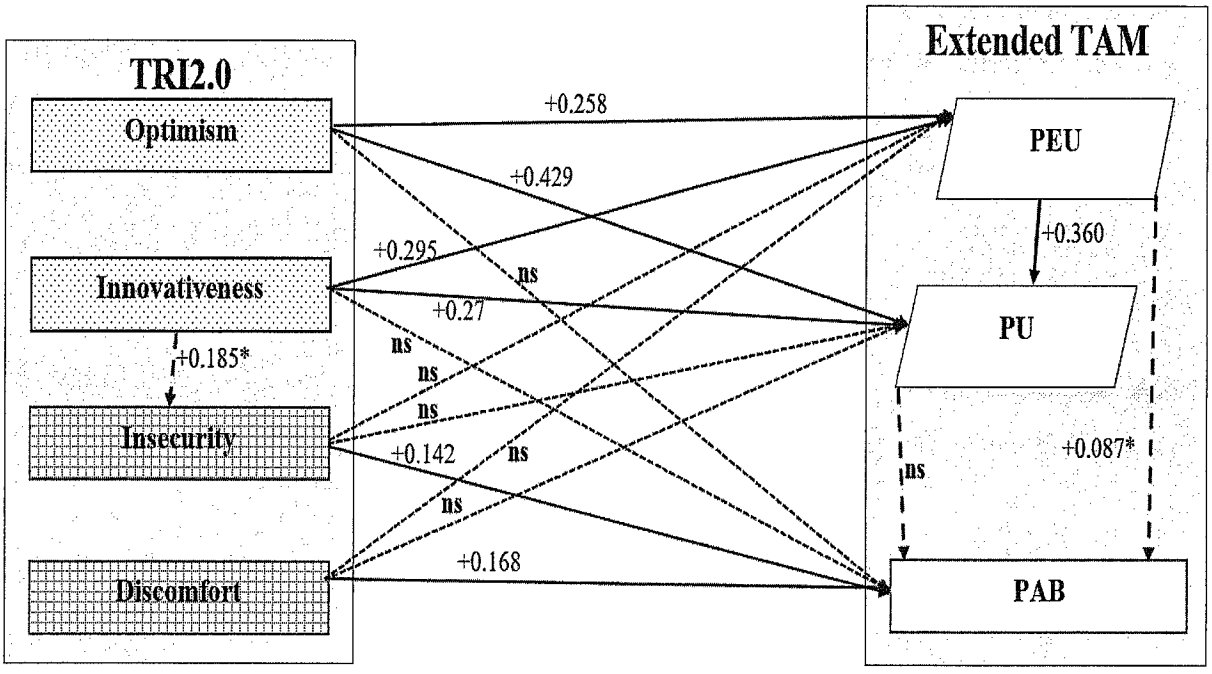
Hypotheses	**Decision**

H1A: There is relationship between *optimism* and *perceived ease of use* of a specific technology.	Supported (β=.258; $p<0.05$)
H1B: There is a relationship between *optimism* and *perceived usefulness* of a specific technology.	Supported (β=.429; $p<0.05$)
H1C: There is a relationship between optimism and perceived access barrier of a specific technology.	Not supported (β=.061; $p>0.05$)
H2A: There is a relationship between innovativeness and perceived ease of use of a specific technology.	Supported (β=.295; $p<0.05$)
H2B: There is a relationship between innovativeness and perceived usefulness of a specific technology.	Supported (β=.273; $p<0.05$)
H2C: There is a relationship between innovativeness and perceived access barrier of a specific technology.	Not supported (β=-.021; $p>0.05$)
H3A: There is a relationship between insecurity and perceived ease of use of a specific technology.	Not supported (β=.041; $p>0.05$)
H3B: There is a relationship between insecurity and perceived usefulness of a specific technology.	Not supported (β=.047; $p>0.05$)
H3C: There is a relationship between insecurity and perceived access barrier of a specific technology.	Supported (β=.142; $p<0.05$)
H4A: There is a relationship between discomfort and perceived ease of use of a specific technology.	Not supported (β=.048; $p>0.05$)
H4B: There is a relationship between discomfort and perceived usefulness of a specific technology.	Not supported (β=-.062; $p>0.05$)
H4C: There is a relationship between discomfort and perceived access barriers.	Supported (β=.168; $p<0.05$)

H5: There exist negative relationship between TR-Motivators and TR-Inhibitors (i.e. Positive and Negative dimensions of TRI 2.0).	Not supported (β=.185; $p<0.05$)*
H6: Perceived ease of use is negatively related to perceived access barrier.	Not supported (β=.087; $p<0.05$)*
H7: Perceived usefulness is negatively related to perceived access barrier.	Not supported (β=-.022; $p>0.05$)
H8: Perceived ease of use is related to Perceived usefulness.	Supported (β=.360; $p<0.05$)

*The finding is opposite to the hypothesized direction

The above relationships are pictorially depicted in Figure 11 below:



* a significant relation but opposite to the hypothesized direction.

ns= not a significant relationship

Figure 11: Overview of the results

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Using the composite research model as a theoretical framework, computer technology acceptance and readiness was investigated. Predictions on how students might respond to computer-mediated learning and strategic techniques for sustainable implementation of computer-mediated learning system in universities are presented. Researchers might consider this finding as a threshold for further studies in Nigeria and similar developing countries. For future studies limitations encountered should be taking into account; especially the perspective of the sample size and span of geopolitical zone considered. Another major contribution; by examining the relationship between TRI 2.0 and extended TAM, the researcher was able to demonstrate that personality matters in the process of accepting computer technologies. Personality traits as measured with the TRI 2.0 possesses a significant effect on implementation of computer-mediated learning; especially students' optimism and innovativeness that have the strongest impact on PEU and PU of computer technologies.

6.2 Recommendations

The researcher itemized the following suggestions:

- Future researches should include instructors' responses within the data to ensure a balance between students' techno-readiness as well as their teachers.

- Translating the questionnaire items into the native language of the participants might provide improved reliability of the responses in future researches.
- Periodic replication of this research might ensure a coherent feature of the technological progression in northwestern Nigeria.

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APPENDIX

The Research Questionnaire

INVESTIGATING COMPUTER TECHNOLOGY ACCEPTANCE AND READINESS OF STUDENTS: A CASE STUDY IN NORTHWESTERN NIGERIA

This questionnaire aims at knowing your opinion regarding the readiness of incorporating computer technology/internet into university education. The result of this questionnaire will be used mainly for research work and it will not disclose any of your privacy.

Thank you in advance for answering this questionnaire.

Abdulmalik Ahmad Lawan (*Masters Student*)

Personal Data (*when option is* ***others*** *please specify*)

Age: 18-22☐ 23-27☐ 28-32☐ 33-37☐ 38-42☐ above 42☐

Gender: Male☐ Female☐

Faculty: Art☐ Science☐ Engineering☐ Environment☐ Maths&Computing☐

Others_____

Academic Level: 100☐ 200☐ 300☐ 400☐ 500☐ Others_____

Items		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
OPTIMISM						
1.	New technologies contribute to a better quality of learning/teaching					
2.	Computer technology gives me more freedom of mobility					
3.	Computer technology gives people more control over their daily academic activities					
4.	Computer technology makes me more productive in my academic career					
INNOVATIVENESS						
5.	Other people come to me for advice					

	on new computer technologies					
6.	In general, I am among the first in my circle of friends to acquire new technology when it appears					
7.	I can usually figure out new high-tech products and services without help from others					
8.	I keep up with the latest technological developments in my areas of interest					
DISCOMFORT						
9.	When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do					
10.	Technical support lines are not helpful because they don't explain things in terms I understand					
11.	Sometimes, I think that technology systems are not designed for use by ordinary people					
12.	There is no such thing as a manual for a high-tech product or service that's written in plain language					
INSECURITY						
13.	People are too dependent on technology to do things for them					
14.	Too much technology distracts people to a point that is harmful					
15.	Technology lowers the quality of relationships by reducing personal interaction					
16.	I do not feel confident learning/teaching with a place that can only be reached online					
PERCEIVED USEFULNESS						
17.	Computer enables me to accomplish tasks more quickly					
18.	Using computer improves my job/academic performance					
19.	Using computer increases my productivity					

20.	Using computer enhances my effectiveness on the job/studies					
21.	Using computer makes it easier to do my job/ studies					
22.	Overall, I find computer useful in my job/ studies					
PERCEIVED EASE OF USE						
23.	Learning to operate the computer is easy for me, I find it cumbersome to use the computer					
24.	I find it easy to get the computer to do what I want it to do					
25.	Usage of the computer is clear and understandable					
PERCEIVED ACCESS BARRIERS						
26.	I do not have the money to get Internet access for personal use					
27.	I cannot afford the Internet for personal use					