

University Staff Adaption: An Empirical Study using the Unified Theory of Acceptance and Use of Technology and Extended Technology Acceptance Model II (Northern Border University, Saudi Arabia)

Wael Sh. Basri

Northern Border University, College of Business Administration
College of Business Administration, ArAr. Saudi Arabia
Email: wael.basri [AT] nbu.edu.sa

ABSTRACT--- *Whenever institutions aspire to implement ICT systems, there are preliminary considerations to ponder for overall success. This paper examine ICT from the context of Northern Border University in Saudi Arabia, the paper has identified user variables for acceptance of ICT as performance expectancy, effort expectancy, social influence, facilitating conditions, age, voluntariness of use, experience and training of the users. This paper has discussed each variable before concluding with affirmation of the Technology Acceptance Model (TAM2) under Unified Theory of Acceptance and Use of Technology (UTAUT) as a recommendation for all University leaders to adopt. The considerations of these variables are alive to possibilities that different institutions could be having unique challenges. However, the UTAUT is really a baseline for such institutions with room for modifications.*

1. INTRODUCTION

Many Universities around the world are trying to keep pace with ICT developments use by academics staffs (Mullins, 2002). ICT has impact of the speed of task execution, efficiency of vertical and horizontal communication and effectiveness of data management (Venkatesh, 2000). Nevertheless, studies show that the user acceptance of ICT among University academics and staffs is just average, due to various factors (Ma & Liu, 2004). The common type of ICT available for University staff uses are web based applications for internets with Wide Area Networks (WAN) and intranets with Local Area Networks (LAN) (Jong-Ae, 2005; Matyokurehwa, 2013).

The purpose of this paper was to highlight reasons for University staffs accepting or resisting ICT from discussion of Technology Acceptance Model (TAM2) (Vankatesh, 2000) in their execution of duties and responsibilities (Wei-Tsong, & Chao-Yueh, 2004). It is worthy to note that factors leading to the University academic behaviors towards ICT vary according to other institutions and social construct (Chismar & Wiley-Patton 2003). However, TAM2 has been tested, standardized and applied in most studies regarding ICT acceptance, hence, justifying its adoption in this study (Oye, Iahad & Rabin, 2011).

This paper was inspired by lack of updated information on acceptance of ICT by University staffs in Saudi Arabia, and it is a follow up of past few studies, which adopted qualitative and quantitative methods under UTAUT. This paper analyzed various literature that appreciate the advances and penetration of ICT in Universities, yet the actual acceptance for purposes like teaching, administration and general communication is marginal with room for improvement (Jong-Ae, 2005; Ma & Liu, 2004; Rather & Kuraishy, 2015)

2. LITERATURE REVIEW

Despite all these lucrative opportunities that ICT offer University academics and staffs, studies show that the penetration and acceptance of such technologies is lagging behind in many higher learning institutions. Consequently, some of the most highlighted variables for acceptance of ICT are performance expectancy, effort expectancy, social influence, facilitating conditions, gender, age, voluntariness of use, experience and training of the users (Oye, et al., 2011; Basri & Suliman, 2012; Lane & Stagg, 2014).

Performance expectancy (PE) closely relates to perceived usefulness of ICT to inspire University academics and staffs to accept use (Oye, et al., 2011). Therefore, the user confidence is supposed to fortify according to personal trust and beliefs that ICT and associated innovations will hasten objective achievements with minimal barriers. Zeithaml, et al., (2002) who supports this argument also adds that PE is a matter of chance that a user attaches to ICT to efficient tasks accomplishment. This implies that if the users foresee performance gaps or limited probability that a job will be effective by ICT, then acceptance valence minimizes (Gefen & Straub, 2000).

PE theory further manifests when ICT users perceive that no better options exist at the time of considerations by the University. Therefore, existence of substitutes to ICT facilities proposed by the institution can delay, divert or deter acceptance by the users. Even fundamental issues like counterfeit ICT hardware can cause significant doubt in the mind of users who advance inferior performance expectancies and do not accept the facilities, preferring instead to remain loyal to tested and proven systems. Consequently, a University ICT change program must buy in comprehensive consultations and inclusion of all stakeholder representatives to understand their views and concern for or against acceptance of proposed technology shifts (Oye, et al., 2011).

Effort expectancy manifests when an ICT user anticipates specific outcomes (Oye, et al., 2011). Therefore, the effort is an attitudinal basis to accept ICT on the probability that users or organizational goals will result from measured inputs (Fishbein & Ajzen, 1975). Effort expectancy also hinges on expectancy value model that certain metrics associated with the ICT user beliefs will yield some results. Consequently, in the context of Universities, academics and staffs always plan individual and group behaviors by assessing their potential performances and expected benefits. Thus, if the expected outcomes are low, the efforts valence will diminish and vice versa. Moreover, University academics and staffs tend to avoid any efforts that could yield negative outcomes of accepting ICT because there could be social or administrative sanctions by the authorities for violation of misuse policies (Kozma, 2005; Matyokurehwa, 2013).

Research reveals that the more cosmopolitan a University staff or academic is, the more likely to accept ICT in accomplishing various tasks (Oye, et al., 2011). This implies that the more socially exposed the academics and staffs are, the more positivity perceived about the benefits and advantages of using ICT. Studies also show that social influence is a major determinant of ICT acceptance in various academic fields like healthcare, agriculture, energy, economics, education among others. There are hypothesis that cosmopolitan social influence exposes the academics to developments such as television, computers and internet where essential interactions take place, furthering then needs for embracing ICT in general (Rogers, 2003).

Research shows that **facilitating conditions** of ICT affect the acceptance of use by University academics and staffs (Oye, et al., 2011). Specifically, studies show that private universities tend to have better ICT infrastructure than public institutions (Ma & Liu, 2004). Lack of fund by the University is a serious facilitating condition that can delay or deter acceptance of ICT use by academics and staffs, because system upgrade and expansion also delays indefinitely. Ultimately, obsolete ICT systems do not inspire users and may actually cause loss of data rather than enhance efficiency and effectiveness and funding timely and adequate funding can unlock such challenges. Lack of funds also inhibits training preparations that is supposed to improve individual skills and acceptance of ICT.

As a change leader, the University is supposed to sponsor academics and staffs to accept ICT. These sponsorships come in form of taking academics and staffs to seminars and workshops to learn the synergies and competitive advantages of accepting ICT to accomplish tasks. Additional sponsorships can adopt the value of Universities providing academics and staffs tablet, computers, laptops and any other ICT gadgets that to meet diverse work objectives. The ownership of such hardware can be negotiated with the academics and staffs; whether they can transform to personal effects with micro-surcharging arrangements of the users or if they will remain official property of the institution. However, such sponsorships often relegate as footnotes with other issue taking higher preferences and causing significant adoption delays or resistance to ICT at Universities.

The next common facilitating condition is fluctuations of power supplies. In many institutions of higher learning, power supply is erratic and prolonged blackouts can delay tasks or sometimes loss of data is supplementary backup systems were not in place. In some instances, power surges cause electric faults to ICT facilities and installations, which often discourage users acceptance, unless with guarantee of backups and cloud systems to store data and information. Common energy backups include Uninterrupted Power Supplies (UPS) and solar panels. Even if such facilities result in overhead cost to the Universities, the role in inspiring ICT acceptance can neither be overlooked nor gainsaid among academics and staffs as studies have alluded (Bakkabulindi, 2011).

University staff compensation is a key determinant of ICT acceptance because it motivates positive behavior. There probability that different University staffs have varied ranks, duties and responsibility. Coupled with the need to

use ICT for task accomplishments, staff attitudes can be positive or negative in acceptance depending on remuneration codes. If two or more staffs are expected to execute similar task with ICT, yet their compensations vary for not justifiable appraisal outcomes, it is expected that conflict shall arise and the prejudiced parties will not accept the call for change. This slow acceptance or rejection of ICT project occurs because of sour relationship and feelings of favoritism of peer staffs (Matyokurehwa, 2013).

There are theories that ICT acceptance among University academics and staffs vary on gender lines (Oye, et al., 2011). Consequently, some researcher hold that the traditional roles of females in the society coupled with academic works can hinder their acceptance of ICT because of little time to learn innovations and apply the same in tasks. Contrary hypotheses state that such duplicity of female commitments should actually inspire them to accept ICT because it improves their speed of multi tasking, efficiency of coordination and effectiveness in coping with work pressure. Other studies find that the marginalization of females in certain cultures leads to their late exposures and subsequent acceptance of ICT in academic functions. However, research also shows that academic women bogged down with domestic work can leverage ICT to extend meetings and accomplish the socially instigated chores (Bakkabulindi, 2011; Basri & Suliman, 2012).

The hypothesis about age and acceptance of ICT among University academics and staffs is perhaps partially admissible, because the current advances in ICT are not more than three decades old (Oye, et al., 2011). However, some academics and staffs that served longer than that period have generational gaps in ICT trainings and orientations. This is in reference to academics and staffs who have been in services before the 1980s. According to Schiffman and Kanuk (2004), age is a major determinant of ICT acceptance in more areas like innovations and adoption of features like online purchasing of goods and services. With reference to University staffs and academics, there can be need for online purchase of e-publications or just subscription to access some databases and periodicals via e-commerce tool. Yet, for pessimistic hard line views, some other academics and staffs worry about security and authorized access issues and this becomes a major determinant of their acceptance of ICT (Bakkabulindi, 2011).

Research has proved that user experience is another key determinant of acceptance of ICT among University academics and staffs (Oye, et al., 2011). ICT experience enables the academics to keep touch with trends and changes so that innovations embrace at the earliest opportunities (Rogers, 2003). ICT experience further exposes the staffs to different working approaches by contributing to their technological skills and stimulating consultative instincts (Taylor & Todd, 1995). ICT experience lower the tendencies of resistance to adopting technology among University academics because familiarity breeds confidence and models new users to follow suit. Furthermore, ICT experience exposes the University academics to support any current and future organizational change for enhancing service competitive advantage (Bakkabulindi, 2011; Basri & Suliman, 2012).

However, experience gaps could overcome by training as a strategy preferred by many institutions of higher learning. In order to increase acceptance of ICT by university academics and staffs, training is a deliberate intervention on the user behavior, accomplished at a controlled or free environment to influence formal and informal experiences. Training boosts user confidence in ICT applications by introducing trendy features and updating attitudes. Training enhances skills and efficiency of ICT uses which later increases changes of acceptance of related technologies (Oye, et al., 2011).

3. MODELLING AND RECOMMENDATIONS FOR ICT ACCEPTANCE

This model (figure-1) is a conclusive demonstration of the factors that determine use acceptance of Information and Communication Technology by University staffs and academics. Performance expectancy (Oye, et al., 2011) was identified as a determinant of the user acceptance of ICT whereby, productivity, efficiency and effectiveness guide decision-making and attitudes. Effort expectancy (Oye, et al., 2011) was cited as a determinant of ICT acceptance on the knowledge that user weigh in whether their inputs are worth the outcomes for adopting change. Therefore, Assuming that the relationships between the research variables were hypothesized

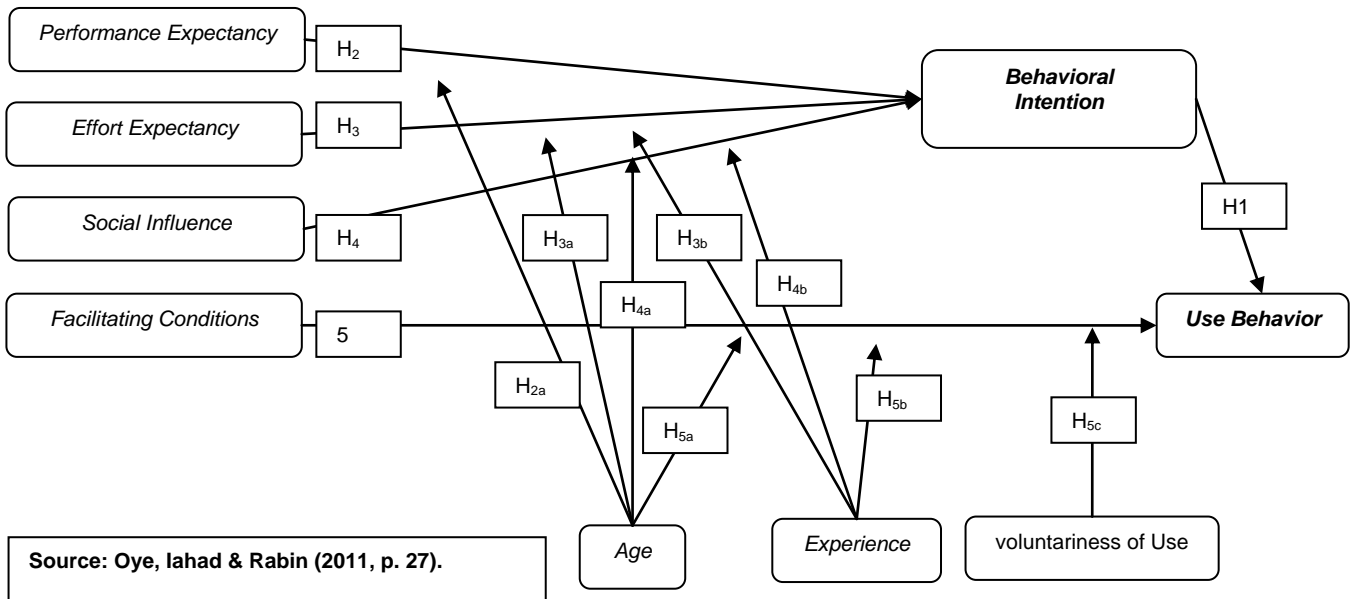


Figure 1 Unified Theory of Acceptance and Use of Technology

- H₁: Behavior Intention positively and directly influence User Behavior.
- H₂: Performance Expectance positively and directly influence Behavior Intention.
- H_{2a}: Age mediate the relationship between Performance Expectance positively and directly influence Behavior.
- H₃: Effort Expectancy positively and directly influence Behavior Intention.
- H_{3a}: Age mediates the relationship between Effort Expectancy and Behavior Intention.
- H_{3b}: Experience mediates the relationship between Effort Expectancy and Behavior Intention.
- H₄: Social Influence positively and directly influences Use Behavior.
- H_{4a}: Age mediates the relationship between Social Influence and Behavior Intention
- H_{4b}: Experience mediates the relationship between Social Influence and Use Behavior.
- H₅: Age positively and directly influences Use Behavior.
- H_{5a}: Experience mediates the relationship between Social Influence and Use Behavior.
- H_{5b}: Experience mediates the relationship between Facilitation Conditions and Use Behavior
- H_{5c}: Voluntariness mediates the relationship between Facilitation Conditions and Use Behavior.

Refers to variables omitted from the UTAUT model, e.g. volunteer and training the return data showed an extensive no respond. The researcher was unable to access any data for the secondary sources, for clarity's sake the researcher had to omitted volunteer and training from the framework.

4. DATA ANALYSIS

A variety of methods are used to assess the relationship between variables. Each has its advantages and drawbacks. A useful tool for construct a framework is structural equation modeling (SEM), used to show the links between the framework variables that have been included in the study model. the study uses SEM for high modeling complex dependencies and better analysis of latent variables, as well as the main reasons to use SEM.

Data collected from participants using a questionnaire adapted from Basri, & Suliman, 2012. For the sake of reliability of the study a 200 university staff randomly selected (Hair, Black, Babin, Anderson, & Tatham, 2010). The purpose of this study is not to examine female attitude, therefore the sample was all the university male staff, the majority 70% was PhD holder, over half of them age between 40-50. Data was calculated by AMOS (Analysis of MOment Structures), we are able to analysis the data.

The data was validated and discriminate. Based on SEM, the problems associated with the research data were looked into. For instance, the normality of the data was checked, in addition, the results demonstrate values of standard

deviations (0.73-1.18), kurtosis indices (-0.15 - 4.5) and skewness index (-0.6 - 2.0) respectively. Finally, the study uses Cronbach's alpha as reliability measure, a value of 0.90 was measure.

5. MODEL FIT

For the purpose of model fit, different sets of gauge used in the study as it shows in table one. The absolute fit indices, the standardized root mean residual, the room of mean square error of approximation, parsimonious fit index and P-CLOSE are used to test the model fit (Hair et al., 2010). A specific modification of the model conducted, which was significant to attain acceptable fit existed in terms of the sample data, and the model hypothesis (Carmines and McIver, 1981; McDonald and Ho, 2002). Table one shows the model fit indices for the study model.

Table one Fit Indices for the Research Model

<u>Model Fit Indices</u>	<u>Value</u>	<u>Recommended Guide lines</u>	<u>References</u>
(χ^2/df)	1.6	≥ 0.3	Kline, 2005; Hair, 2010
CFI	0.92	≥ 0.90	McDonald and Ho, 2002; Hair, 2010
GFI	0.91	≥ 0.90	Klem, 2000;; Hair, 2010
REMSA	0.03	≤ 0.08	McDonald and Ho, 2002
PCLOSE	0.61	≥ 0.50	Klem, 2000; Hair, 2010

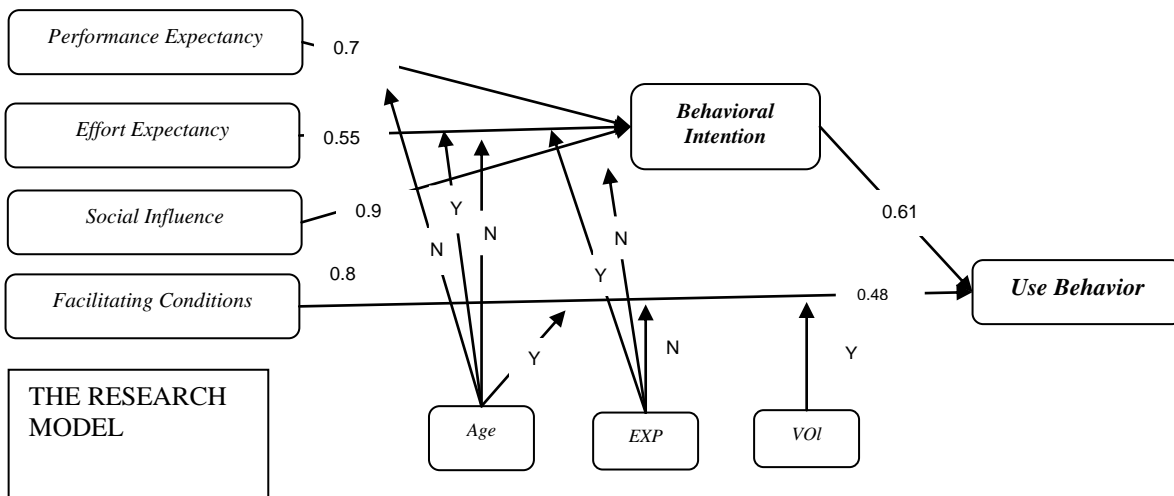


Figure 2 Research Model

Table Two the model Hypotheses and weight

<u>Hypotheses</u>		<u>Path</u>		<u>Std Regr. weight</u>	<u>Result</u>
H ₁	Behavioral Intention.	→	Use Behavior	0.61	Support
H ₂	Performance Expectance	→	Behavioral Intention.	0.70	Support
H _{2a}	Age	↓	Perf.Expec. and Behv.Inti	N	Support
H ₃	Effort Expectance	→	Behavioral Intention.	0.55	Support
H _{3a}	Age	↓	Effor.Expec. and Behv.Inti.	Y	Support
H _{3b}	Experience	↓	Perf.Expec. and Behv.Inti	N	Support
H ₄	Social Influence	→	Behavioral Intention.	0.9	Support
H _{4a}	Age	↓	Effor.Expec. and Behv.Inti.	Y	Support
H _{4b}	Experience.	↓	Perf.Expec. and Behv.Inti	N	Support
H ₅	Facilitating Conditions	→	Use Behavior	0.48	Support
H _{5a}	Age	↓	Effor.Expec. and Behv.Inti.	N	Support
H _{5b}	Experience	↓	Perf.Expec. and Behv.Inti	N	Support
H _{5c}	Voluntariness of Use	↓	Facili.Condi. And Use Behavior	Y	Support

This model is a conclusive demonstration of the factors that determine use acceptance of Information and Communication Technology by University staffs and academics. Overall, This study produced results which corroborate the findings of a great deal of the previous work in this field table two.

These findings of the current study are consistent with those of Oye, Iahad and Rabin (2001) who found performance expectancy was identified as a determinant of the user acceptance of ICT whereby, productivity, efficiency and effectiveness guide decision-making and attitudes. Effort expectancy (Oye, et al.. 2011; Lane & Stagg, 2014) was cited as a determinant of ICT acceptance on the knowledge that user weigh in whether their inputs are worth the outcomes for adopting change.

Social influences (Oye, et al.. 2011; Basri & Suliman, 2012; Lane & Stagg, 2014) were cited from arguments of cosmopolitan exposure to technology and income levels that determine which trainings people access to prepare them psychologically for ICT challenges in future. Social influence is also from elitist suppositions that ICT users have general positive attitudes and will accept such project (Zhang, Li & Sun, 2006).

Facilitating conditions (Oye, et al.. 2011) had diverse considerations from the University ICT infrastructures, differences between private and public institutions, sponsorship of users, stable power supplies and back up during down times, fair compensation of staffs and transparent appointment of change leaders. Breakdown in any of the cited and

other facilitating conditions will definitely lower user acceptance. This finding supports previous research of Oye, Iahad & Rabin (2011) and Matyokurehwa (2013).

Age issue (Oye, et al.. 2011) was capture for their potential to shape University staff acceptance of ICT use. Even though the youthful persons trend with ICT from educational exposures, the older generations studies provided mixed findings, that they can either resist or adapt in order to secure jobs and remain relevant. In conclusion, the age issue will be diminishing in importance with time as new generation of University staffs replace the old ones.

Experience and training factors (Oye, et al.. 2011; Basri & Suliman, 2012) have credible impact on University ICT user acceptance. Ordinarily, the more experienced staffs have least resistance to accepting ICT because of naturalized exposure and task orientations. In the contrary, the least experienced staffs will resist due to lack of adequate preparation and skills to execute tasks in ICT manner. This study concludes that training is one way that Universities have been closing the experience gaps. Training whether as a deliberate proactive effort or reactive process increases the user skills, confidence, exposure and acceptance of ICT facilities and later translated to faster acceptance of system changes.

Finally, the voluntariness of use (Oye, et al.. 2011) was identifies as a potential determinant of ICT use acceptance in Universities on the context that academics and staffs must be willing to participate in such change processes for success to achieve. Additionally, this study concludes that voluntariness of use saves institutions of higher learning a lot of implementation resources and time.

6. CONCLUSION AND RECOMMENDATIONS

This paper has a general recommendation University staffs must be adequately involved and trained in ICT as a prerequisite for their use acceptance before consideration of other individual dynamics. This paper further recommends that all issues raised in the Model of Unified Theory of Acceptance and Use of Technology (Oye, et al.. 2011) be followed up individually and collectively on a case-by-case basis because some institutions could be having unique challenges barring ICT acceptance.

This paper has competently identified and discussed factors that determine the acceptance of ICT by University staffs and academics. Even though the list is not exhaustive, this paper highlighted the most common theories and positions that affect acceptance of ICT in Universities in a model. The TAM model was covered under the Unified Theory of Acceptance and Use of Technology (Oye, et al.. 2011) by considering individual differences and reactions to changes involving ICT. This paper is limited it is examined male staff, more consideration for female staff is needed. Further investigations is must be done on different schools and larger sample size.

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