

A STUDY OF INFORMATION TECHNOLOGY
ADOPTION IN HIGH EDUCATION INSTITUTIONS IN
THE STATE OF KUWAIT

BY

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ABSTRACT

The world scenario has been changed by Information and Communication Technology (ICT), and many factors including new opportunities, fast-growing businesses, technological changes, and challenges have forced every part of the world to produce self-regulating and to pre-found skilled oriented individual. Driven by this compulsion the high education institutions (HEI) around the globe are integrating ICT tools and utilizing the latest technologies in order to provide quality education to their citizens. In this regard Ministry of Education (MOE) Kuwait has launched many plans and invested a lot in the implementation of technology in HEIs. HEIs mainly consists of Universities. There is no comprehensive study in order to assess the adoption of ICT in the universities by all main stakeholders of Kuwait as well as no empirical study have been conducted on the overall effectiveness of ICT in the HEI (s). The effectiveness of any new technology depends upon acceptance and proper utilization of technology by all stakeholders. Subsequently, realizing the importance of ICT availability and success in all parts of society, this research aimed to understand, investigate, explore, and assess the ICT adoption in the universities of Kuwait. Meanwhile, in order to assess the adoption and utilization of ICT by students and academicians in their daily work, this research proposed a model by adopting variables Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Behavioural Intention (BI), and Use Behaviour (UB) from Unified Theory of Acceptance and Use of Technology (UTAUT) with external factors such as Compatibility, Perceived Needs, Self-efficacy, Complexity, and Culture. The proposed research model was validated through Structural Equation Modeling (SEM) using Smart-PLS software. A total of 401 were collected through stratified random & purposive sampling methods using five-point Likert scale. Research findings indicate that nine out of eleven hypotheses were found to be statistically significant. Moreover, BI, compatibility, PE, and FC were found most significant factors that influence UB to accept ICT. Results further revealed that 54.1% variance in BI and 45% in UB is explained. Besides, many theoretical and methodological contributions for academicians, this research seizes many significant practical and theoretical implications for researchers, practitioners, information, and many other governmental and non-governmental institutions.

خلاصة البحث

لقد تغير الوضع العالمي من خلال تقنية المعلومات والاتصالات بالإضافة إلى تأثير عوامل أخرى كالفرص الجديدة، والنمو السريع في بيئة الأعمال، والتغيير التكنولوجي، والتحديات التي تؤثر بقوة في جميع اجزاء هذا العالم وذلك من أجل إنتاج تنظيمات وتوجيهات ذاتية لمهارات الافراد . وبناءً على هذه الدوافع فإن مؤسسات التعليم العالي في أنحاء العالم تقوم بتكامل الأدوات الخاصة تقنية المعلومات والاتصالات كما تقوم باستخدام التكنولوجيا الحديثة من اجل تقديم مستوى جيد من التعلم واستخدام التكنولوجيا الحديثة من اجل تقديم تعليم نوعي لمجتمعاتهم. وفي هذا الجانب قامت وزارة التعليم في دولة الكويت بالبدء في وضع الخطط والاستثمار الكبير في هذا المجال لتطبيق التكنولوجيا في مؤسسات التعليم العالي والتي تتضمن الجامعات بشكل رئيسي. ونظرا لعدم وجود دراسة شاملة من أجل تقييم تبني تقنية المعلومات والاتصالات في الجامعات الكويتية لجميع أطراف العملية التعليمية من أكاديميين وطلاب بالإضافة لعدم وجود دراسة تجريبية فاعلة بشكل كامل تقنية المعلومات والاتصالات في مؤسسات التعليم العالي، فلذلك الأسباب وبناء على ما سبق فإنه تجدر الإشارة هنا أن هذا البحث يهدف الى الفهم والتحقيق والاكتشاف والتقييم لتبني تقنية المعلومات والاتصالات في الجامعات بدولة الكويت. وفي هذه الأثناء ومن أجل تقييم تبني واستخدام تقنية المعلومات والاتصالات من قبل الطلبة والأكاديميين في اعمالهم اليومية فإن هذا البحث يقدم نموذج من خلال تبني متغيرات مختلفة مثل الأداء المتوقع، الجهد المتوقع، التأثير الاجتماعي، شروط التسهيل، السلوك التحفيزي، سلوك الاستخدام من النظرية الموحدة لقبول واستخدام التكنولوجيا. بالإضافة الى عوامل خارجية مثل، التوافقية، إدراك الاحتياجات، التأثير الذاتي، درجة التعقيد وأخيرا الثقافة. ومن ثم تقييم خلاصة النموذج المقترح لهذا البحث من خلال فحص نماذج المعادلات الهيكلية باستخدام البرنامج الإحصائي بي إل إس، و تم جمع عينة عشوائية طبقية مكونه من 401 شخص مستخدماً خمس نقاط على مقياس ليكرت. حيث أشارت نتائج البحث أن تسعة من أصل إحدى عشر فرضية ذات دلالة إحصائية مما يعني أن هناك عاملين ليسوا ذات أهمية. أضف الى ذلك أن عامل شروط التسهيل كان الاكبر والاهم بين العوامل من حيث الدلالة الإحصائية والتي تؤثر على سلوك الاستخدام من أجل قبول تكنولوجيا المعلومات والاتصالات. كما أن النتائج أظهرت 51 % من التباين في السلوك التحفيزي و 45 % في سلوك الاستخدام وقد تم شرحهم بالتفصيل، بالإضافة الى أن هذا البحث ساهم بطرق منهجية ونظرية تُخدم الأكاديميين بشكل خاص، و أخيرا فإن هذا البحث احتوي على العديد من الاثار العملية والنظرية الهامة لكل من الباحثين والطلبة والاكاديميين وأيضا للعديد من المؤسسات الحكومية وغير الحكومية.

APPROVAL PAGE

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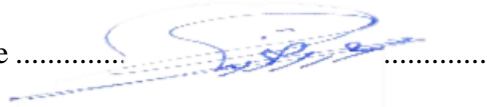
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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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I Would Love To Dedicated This Work To My Lovely And Wonderful Wife “Asmaa

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LIST OF ABBREVIATIONS

2G	2 nd Generation
3G	3 rd Generation
4G	4 th Generation
AGFI	Adjusted Goodness-of-Fit Index
AMOS	Analysis Moment of Structures Software
ANOVA	Analysis of variance
AVE	Average Variance Extracted
BI	Behavioral Intention
CDMA	Code Division Multiple Access
CFA	Confirmatory Factory Analysis
CFI	Comparative Fit Index
COM	Compatibility
CR	Critical Ratio/Composite Reliability
CS	Cost
DF	Degree of Freedom
EFA	Exploratory Factor Analysis
EJIS	European Journal of Information System
FA	Factor Analysis
FC	Facilitating Conditions
FDMA	Frequency Division Multiple Access
GDP	Gross Domestic Product
GFI	Goodness-of-Fit Index

GOF	Goodness-Of-Fit
HEI	Higher Education Institutes
ICT	Information and Communication Technology
IDT	Innovation Diffusion Theory
IS	Information Systems
ISJ	Information Systems Journal
ISR	Information Systems Research
IT	Information Technology
KMO	Kaiser-Meyer-Olkin
LBS	Location Based Services
LISREL	Linear Structural Relations
LV	Latent Variables
MAR	Missing at Random
MCAR	Missing Completely at Random
MI	Modification Indices
ML	Maximum Likelihood
MM	Motivational Model
MMS	Multimedia Message Service
MNAR	Missing not at Random
MoE	Ministry of Education
MOIT	Ministry of Information Technology
MPCU	Model for PC Utilization
MVA	Missing Value Analysis
NFI	Normed Fit Index

OFDMA	Orthogonal Frequency Division Multiple Access
PBC	Perceived Behavioural Control
PC	Personal Computer
PCA	Principal Component Analysis
PDA	Personal Digital Assistant
PEOU	Perceived Ease of Use
PLS	Partial Least Square
PU	Perceived Usefulness
RMSEA	Root Mean Square Error of Approximation
RSK	Risk
SCT	Social Cognitive Theory
SE	Standard Error
SEM	Structural Equation Modeling
SI	Social Influence
SIC	Squared Inter-construct Correlations
SM	Structural Model
SMS	Short Message Service
SN	Subjective Norms
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TDMA	Time Division Multiple Access
DTPB	Decomposed Theory of Planned Behaviour
TPB	Theory of Planned Behaviour
TR	Trust

TRA	Theory of Reasoned Action
UK	United Kingdom
US	United States
UTAUT	Unified Theory of Acceptance and Use of Technology
WAP	Wireless Application Protocol
WWW	World Wide Web

CHAPTER ONE

INTRODUCTION

1.1 OVERVIEW

The significant use of technology involves the generation of processes and knowledge to establish and develop a system that can solve the issues and extend human competence. Technology can alter or change the way how individuals access, gather, analyse, transmit, present, and simulate the information (See, 1994). Tinto (2002) defined information and communication ICT as a combination of various technological tools and resources used in order to create, communicate, store, disseminate and information management. ICT refers to the collection of approaches and tools that are used in collecting, storing, processing, and communicating information (Rafiu Olatoye, 2011). According to Tinto (2002), ICT has created a central platform for people around the world to acquire new technologies and develop new skills. At present, it is a necessity for the countries around the world to implement effective and efficient ICT tools and techniques in order to survive in the competitive world.

The localized or national problems are being cured with usage of technology in education sector. Similarly, to live, learn, and work effectively in the 21st century, the digitally advanced century, students and academicians use ICT viably. Advanced proficiency is significant for skills in this new era. Today, students and academicians should have the option to think innovatively, fundamentally, cooperatively and be prepared to rapidly react to challenges; they need to grow their insight to become responsible, knowledgeable, and skilled in order to contribute to the society.

Through ICT, students and academicians figure out how to be inventive products, technologies, and advanced systems frameworks and simultaneously dependable people who comprehend the universe of work and as such settle on proper decisions for their future. Students learn computerized innovation and can execute those significant abilities in their social, cultural and monetary life, and add to the improvement of their general public and their nation's economy. The results of ICT understanding extend human prospects by tending to needs and acknowledging openings. Transformation and advancement are at the core of ICT practice. Quality results come about because of critical thinking and practices.

Learning and usage of ICT will assist students and academicians with realizing how to utilize advanced devices, programming, and equipment, recreate cycles, and program successfully and innovatively a scope of data to tackle issues, to be gainful and imaginative, to convey viably on nearby and worldwide levels for individual, instructive, network, social and business purposes. Learning ICT will help to see 'how and when' to utilize ICT apparatuses for finding imaginative and powerful arrangements. Students who comprehend ICT can configuration devices for activity and ready to contemplate where ICT can uphold intercessions. ICT aptitudes will likewise be valuable in all educational plan zones as apparatuses to improve and build learning and advance public attachment among understudies.

Innovation is fundamentally connected to the universe of 'life and work' as it utilizes its own specific information and aptitudes, along with those of different orders. Innovation is growing rapidly and ICT gives the chance to HEIs to assist Students and academicians with building up their maximum capacity. With phenomenal instructing and canny utilization of the educational program, students will have the option to utilize ICT to make important commitments to current society.

Kuwait is moving forward towards technology use and already implemented ICT in the education system from primary to high education institutions HEIs. The present status of ICT in HEIs of Kuwait is in practice, the government of Kuwait has invested massive amount in the HEIs to build and promote high-quality education, and MoE Kuwait has introduced a series of programs in order to establish a prominent ICT infrastructure which provides internet connectivity to HEIs across the country. ICT components such as efficient infrastructure, video conferencing, digital libraries, online contents, and much more (Al-Sharhan, 2018). Whereas, despite many efforts to place ICT as a central point of university teaching and learning, the reality remains that most of the academic staff are limited to the formal use of computer technology, and the same pattern is followed by the students (Alkharang & Ghinea, 2013a; Wiseman et al., 2014). The controlling authority on HEIs in Kuwait sees the very poor quality of teachers, lack of student motivation, the absence of relevant content on social, business and student discipline requirements (Alkharang & Ghinea, 2013b; Wiseman, Alromi, & Alshumrani, 2014; Aldhafeeri & Alajmi, 2016). To compete with the modern education system across the world, Kuwait needs to develop the skills of its personnel with new technologies and modern management practice (Al-Ansari, 2006). Individual behavioural and administrative settings are also obstacles that inhibit modern education system adoption (Al-nakib, 2015). Effective incorporation of ICT in the education system is a complex multi-layered process that involves not the only technology itself, initial investment, getting technology working, but also curriculum and pedagogy, teachers' competence, the readiness of institutions, and long-term financing and many other factors (Tinto, 2002). The present education delivery system, especially in ICT in Kuwait, is not adopted with requirements and necessities of people which is indeed a major concern for the all levels of governments in the 21st century (Al-Sharhan, 2018).

Despite numerous efforts undertaken to put in place ICT and modern education infrastructure usage still seems to be very slow (Al-Ansari, 2006; Al-nakib, 2015). According to report by Global Competitiveness Index 2017-2018 the potential of ICT usage in Kuwait is not adequately leveraged, and access of ICT remains low at 95 positions in the global index (World Economic Forum, 2017). This purposes to study critically effecting factors in adoption and use of ICT across HEIs, as no empirical study on examining the ICT adoption and use in HEIs of Kuwait exists, specifically to determine obstacles and success factor that might hinder the ICT performance indicators.

Worldwide competition and interconnection create a common platform for all nations in which they willingly take part or not (Law & Pan, 2009). In addition, the countries who are willing to compete in the competitive era must participate in the community. The significant inclusion in the global economy can be achieved through legitimization within the financial community (Robertson, 2005). Similar thought applies to communal institutions as well, especially to HEIs. Plans and policies which relate to societies through socio-legitimized institutions such as national education system. Therefore, in order to take full advantage of the national education system on the institutional capacity to use ICT, dedicated and sustainable professional development is required (Jarning, 2009; Wiseman et al., 2014). Accordingly, for better understanding of factor related to ICT diffusion, availability, and validity across cultures initiates a strong and valid case for developing new models of assessing and transformation of these model outside the geographical settings (Alkhasawneh & Alanazy, 2015; Muriithi et al., 2016; Wiseman et al., 2014). Additionally, these theories and models can affect ICT adoption and acceptance in the HEIs of Kuwait. Modified models attract commitment and people motivation, develop meaning and understanding

in personal ICT skills, readiness starts a standard of excellence in education and develops a connection between current and future plans.

Therefore, this study aims to identify the diverse factors that leave their impact on the acceptance of ICT as well examine the theories and models related to technology adoption and acceptance specifically Unified Theory of Acceptance and Use of Technology (UTAUT) to develop a standard framework for academicians. This study will try to evaluate concerns and practices initiating perception of ICT culture in teaching and learning the HEIs of Kuwait, and also this study will try to identify success factors of it as well and will finally propose a comprehensive model comprising of critical success factors for academicians and students of HEIs.

The overall purpose of this research is to first, assess the current level of ICT adoption in HEIs and then measure the ICT acceptance and use by academicians and students, and finally a standard framework will be proposed containing critical success factor for all stakeholders in HEIs of Kuwait.

1.2 STATEMENT OF THE PROBLEM

It has also been presented that ICT as a means of better learning that will provide students with the requisite knowledge to prepare them for self-dependant with required skills and knowledge (Areepattamannil & Santos, 2019). Governments in most developing countries, including countries in the Arab world, have initiated national programs and strategic plans to introduce ICT into government establishments and universities (Al-Hunaiyyan, Alhajri, & Al-Sharhan, 2018). Even so, the progress of these plans and programs seems to face a variety of difficulties that slow the momentum to reach the expected outcomes. Over the last two decades, many universities have been equipped with different types of new technology; however, the usage of these

technologies in class is still very limited. The infrastructure for ICT is almost available in all higher educational institutions of Kuwait (Al-Sharhan, 2018). However, regardless of fact the huge efforts have been made to position ICT as a central precept of university teaching, learning, and administrating, the reality remains that most of the stakeholders of HEIs such as students, faculty members, and administrative staff have only limited to formal use of ICT (GCC, 2015; Ali, 2017). Another crucial force that needs to be considered in the implementation of ICT in developing countries is the sociocultural factor. Although ICT has long since been adopted among young people in many developing countries including Kuwait (Wheeler, 2003), it is still not an apparent part of culture in HEIs and has obviously not yet been fully adopted by academicians. Some research claims that successful implementation of ICT is subject to various sociocultural, technical, pedagogical and educational factors (Al-Hunaiyyan, Alhajri, & Al-Sharhan, 2018a; Coban & Atasoy, 2019). Such scenario indicates to slow and improper utilization of ICT infrastructure. The delivery of the present education system in Kuwait is not adopted at all levels with the necessities and requirements of the people which is the direction to an existential threat to all stakeholders including governments in the 21st century (GCC, 2015; Al-Sharhan, 2018). Therefore, these conditions increase the need for critical study, analyse, and to determine the causes of failure of proper ICT usage in HEIs of Kuwait. However, few studies are available on assessing ICT adoption and use but still, it requires a comprehensive study to examine the ICT adoption and acceptance in Kuwait universities, especially to determine obstacle that might hinder the required performance of ICT. Moreover, academicians, students, and administrative staff are the backbone of the education system, hence this study will analyse the acceptance and proper utilization of ICT by these stakeholders. This prevailing situation