

Antecedents and Consequences of E-Learning Adoption in Jordanian Higher Education Institution

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ABSTRACT

This research aimed at investigating the factors influencing instructor's intention to adopt e-learning by using Technology Acceptance Model in Jordanian universities. The paper takes a social and technical approach in its investigation by using a research theory based on Technology Acceptance Model (TAM) to identify the factors that affect intention to adopt e-learning. The sample consisted of (320) instructors. They were drawn randomly from the population, by using proportional stratified random sample method. A questionnaire was developed to collect data. Validity and reliability of the tool were assured. Multiple regression Analysis was used to assess the relationships in the constructs. The findings indicated that the perceived usefulness (PU) has a significant influence on behavioral intention (BI) ($P < 0.01$), perceived usefulness (PU) and perceived ease of use (PEOU) have significant influence on Attitude (AT) ($P < 0.01$), but attitude (AT) has no significant impact on behavioral intention BI ($P > 0.01$). The study also provides an indicator of instructors' acceptance of e-learning as well as identifying the important factors that would contribute to its successful use. The outcomes will enrich the understanding of instructor's acceptance of e-learning and will assist in its continuing implementation at Jordanian Universities.

Keywords: Attitude, Behavioural intentions, E-learning, Perceived usefulness, Perceived ease of use, TAM.

INTRODUCTION

Over the past decade there has been a huge revolution in learning and educational computer applications and the use of computers in education, is still in its first steps that increases day by day, but started to take several forms, from computer education to the use of the internet in education, and finally the concept of e-learning technical based to provide educational content to the learner in a good and effective way, through sophisticated computer systems designed for this purpose (Al-Mobaideen, Allahawiah, & Alkhawaldeh, 2012; Muheisen, 2010; Qteishat et al., 2013).

Masrom (2007, p.1) defines e-learning as "learning facilitated and supported through the utilization of information and communication technology (ICTs)". Its use in different educational processes is designed to improve the performance of learning (Al-Adwan & Smedley, 2013). It may be used in many forms, i.e. as a supplement to traditional lectures, asynchronous distance learning, learning management systems or online learning (Al-Adwan & Smedley, 2013). The combination of traditional learning (face-to-face lectures)

According to Yongmei, Elizabeth, and Habte (2012), e-learning has developed rapidly, supported by increasing sophistication in information technology and a better understanding of how to make content and delivery of e-courses effective in universities. Furthermore, e-learning has been adopted by most countries around the world, and implemented by world-class universities (Al-Adwan, AlAdwan, &Smedley, 2013).

The quick growth of internet technologies and web based environments, e-learning is considered vital to all Arab countries. It is a solution to many of its human development problems, but on the other hand, this solution is not as smooth as it seems to be (Altarawneh, 2011). E-learning was rated the fastest growing industry in the field of educational resource production (Algahtani, 2014; Qteishat et al., 2013). Therefore, e-learning is facing a lot of obstacles, barriers, and challenges in Arab countries in its application and Jordan is not exception (Altarawneh, 2011; Qteishat et al., 2013). There is no doubt that the future of e-learning in the field of education is certainly bright to all Arab countries (Subhash, 2012).

Several scholars have highlighted that, understanding the factors that influence users adoption and use of e-learning, is important for a better implementation and adoption of e-learning (Qteishat et al., 2013). Nonetheless, the lack of theoretical or conceptual framework in many past studies dealing with the adoption of e-learning, resulted in inconsistent results and left the question of what constitutes the determining factors of the adoption of e-learning (Al-Obisat et al., 2013). Consequently, demand for the development of e-learning is increasingly growing still need for research on potential factors affecting e-learning in all countries (Khasawneh, 2015), especially in Jordanian universities context (Al-Mobaideen, Allahawiah, &alkawaldeh, 2013; Khasawneh, 2015).

Although wide-ranging research has been carried out on implementation issues pertinent to e-learning design, development, management, delivery, evaluation and operations (Adewole-Odeshi, 2014; Al-Shboul, 2013) instructors is primary considerations in adoption e-learning, and they play a crucial role in specifying the effectivity, success or inefficacy of adoption e-learning (Ali Alamin&Elgabar, 2014; McGill, Klobas, &Renzi, 2014). Nevertheless, very little empirical research has been conducted on instructor adoption e-learning from the perspectives of user intention (Al-Shboul, 2013; Almarabeh, 2014; Nisperos, 2014). Therefore, it is critical to identify the factors that influence instructors adoption e-learning systems to help policymakers in higher education facilitate their use. So there has been and will be a necessity for educational institutions to examine instructors behavioral intention to adoption e-learning and need for research on potential factors affecting e-learning adoption (Ali Alamin&Elgabar, 2014; Nisperos, 2014).

In this paper, the theoretical framework of university instructor's e-learning acceptance and intention to use technology is based on the technology acceptance model (TAM). TAM is robust to investigate the acceptance of various information system applications (Chen & Li, 2011). The model captures both practical and psychological implications in regards of the acceptance of a new information system. It considers the impact of perceived ease of use and perceived usefulness on instructors intention and attitude to use e-learning in their education.

THEORETICAL FRAMEWORK

Technology Acceptance Model (TAM) is an adaptation of the TRA to the field of information system which aims to accurately model how users respond to the presentation of a new technology, addressing factors such as their initial perception, level of acceptance and use of the technology. Davis (1989, cited in Masrom, 2007) first proposed the TAM to trace the

impact of external variables on internal beliefs, attitudes and intentions to accept and use a computer-based technology.

According to TAM as can be perceived through Figure 1.2, user acceptance of any technology is measured by a person's behavioural intention to use the technology. Behavioural intention to use a system is determined by the user's attitude towards using the system and the belief of using the system would enhance his or her job performance (perceived usefulness). Attitude towards target system use is directly affected by two distinct constructs, perceived usefulness (PU) and perceived ease of use (PEOU). In addition, PEOU found to have a direct impact on PU. Behavioural intention directly affects actual system use. Actual system use is a behavioural response measured by the individual's actions in real life. Frequency of use and amount of time spent using a target system is typical of the usage metrics (Davis, 1993)

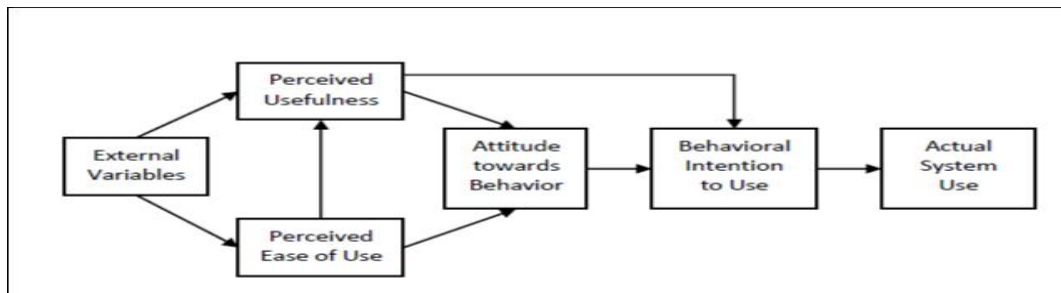


Figure 1: Technology Acceptance Model (adapted from Davis et al., 1989)

TAM appears particularly effectiveness due to its identification of two user acceptance constructs: PU and PEOU, which simplified previous theoretical attempts to measure attitudes towards technology. Thus, TAM has been applied as a reliable and robust model for predicting the user adoption of different technologies, includebut not limited to predicting e-commerce purchasing intention (Madininos et al., 2007); investigating intention to use Decision Support System (DSS) within medium and large business organisations in Croatia (Dulcic,Pavlic&Silic, 2012); predicting tablet computer use among residents or physicians in pediatrics or medical-pediatrics in the United States (Ducey, 2013).

Behavioral Intention to Adopt E-learning

Intention is a psychological construct that refers to an individual's motivation in the form of his or her conscious plan to exert effort to perform behavior (Ajzen, 2005). The concept of intention occupies a central position in cognitive approaches to understanding human behavior (Ajzen, 2012). The concept has been tackled in social psychology research since the early 1950's (Ajzen, 2005, 2012). Intention has commonly been viewed as the “conative” or behavioural component of the tripartite conception of attitude (Rosenberg &Hovland, 1960). Therefore, measures of attitude and intention have often been applied interchangeably to serve as indicator of a person's attitude (Ajzen, 2005).

There is empirical evidence supporting the links between BI and attitudes. From a broader perspective, several meta-analyses of the literature on TRA, TPB and TAM offered a good support for these links (Abbasi et al., 2013; Qteishat, et al., 2014).

Ajzen's (2005) definition of attitude as a “disposition to respond favorably or unfavorably to an object, institution or event”, represents this view. The latter approach conceives attitude as including three components: affective, cognitive and behavioural (Kruglanski&Stroebe, 2005). In TAM and TPB context, attitude is defined as the mediating affective response between usefulness and ease of use beliefs and intentions to use a target system (Suki&Suki , 2011;

Qteishat et al., 2014). These beliefs work as the fundamental source of determining the individual's attitudes. That is the basic building blocks of attitudes (Ajzen&Fishbein, 1980). Davis (1989) stated that one's overall attitude toward using a given system is an antecedent to intentions to use. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). PU is similar to the construct of relative advantage suggested by Rogers in his PCI model (Moore & Benbasat, 1991). A system that is useful in performing the required tasks will allow the user to achieve better performance and benefit from its use (Davis, 1989). Davis (1989) defined Perceived Ease of Use (PEOU) as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). PEOU represents an individual's intrinsic motivation to use a technology (Arbaugh, 2002). However, previous studies found that PU and PEOU are strong predictors of attitude to accept and use a technology (Qteishat et al., 2014).

Defining the research hypotheses

High level of *perceived usefulness* (PU) results in more positive *attitude* (AT) (Abbad et al., 2010; Teo et al., 2008). *Perceived use* (PU) has been consistently found as a direct determinant of behavioral *intention* (BI), and it also influences user's (BI) indirectly as a direct determinant of AT (Abbad et al., 2011; Liu et al., 2005). Therefore,

H1: *Perceived usefulness* (PU) will significantly influence the intensity of instructors behavioral *intention* (BI).

H2: *Perceived usefulness* (PU) will significantly influence the intensity of instructors *Attitude* (AT).

Perceived ease of usefulness (PEOU) was theorized as a direct determinant of *attitude* (AT) by many researchers (Abbad et al., 2011; Park, 2009; Chang, Yan & Tseng, 2012). Improvements in ease of use may not only be beneficial to influence intentions, but also lead to positive attitude. Additionally, PEOU was found to indirectly impact behavioral *intention* (BI) through increased perceived usefulness (PU) (Alatawi et al., 2014; Seket et al., 2010; Lee, Hsieh & Hsu., 2011). Teo (2009) argues that *perceived usefulness* (PU) mediates the effect of *perceived ease of use* (PEOU) on *attitude* (AT). Enhanced *ease of use* (EOU) produces better performance and greater perception of usefulness (Venkatesh and Davis, 2000). Therefore,

H3: *Perceived ease of use* (PEOU) will significantly influence the intensity of instructors *attitude* (AT).

H4: *Perceived ease of use* (PEOU) will significantly influence *perceived usefulness* (PU).

Finally, according to Ajzen and Fishbein (2005), AT drives behaviour and refers to the way that individuals respond to or ignore an object. More importantly, any efforts exerted to heavily implement e-learning rely on the involvement of users attitude. For example, if lecturers believe that technology is insufficient to satisfy their own needs or their instructors, they will resist using it in the learning process (Alatawi et al., 2014). Thus, successful e-learning engagement requires users to possess a positive attitude towards it (Huang & Liaw, 2005). Therefore, AT has been hypothesized as a direct determinant of behavioral *intention* (BI) in the available literature (Alatawi et al., 2014). Therefore,

H5: *Attitude* (AT) will significantly influence behavioral *intention* (BI).

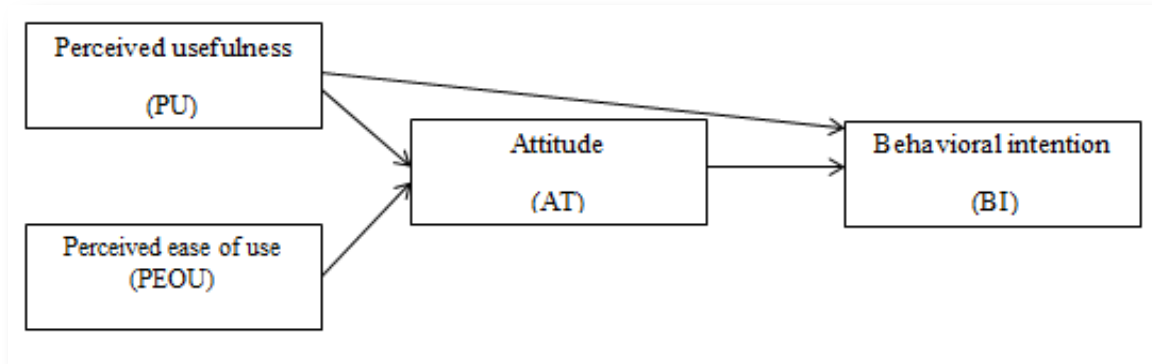


Figure2: Research Model Based on Original TAM (Davis et al., 1989)

RESEARCH METHODOLOGY

The researchers used the descriptive survey methodology, as the appropriate methodology for this research. The questionnaire was adopted to collect data.

Research population

The population of the research comprises of all instructors in both public and private Jordanian universities. The population of this research was (4731) universities instructors holding different specialization.

Research Sample

The sample of study consists of instructors of three public Universities and three private universities in Jordan who have introduced to e-learning. The sampling of this study is done in accordance with regional distributions in Jordan. Jordan is divided into three regions; northern, middle, and southern regions. Three public universities will be chosen randomly from all regions as follows: Yarmouk University from the northern region, Jordan University from the middle region, and Mu'tah University from the southern region. Similarly, three private universities will be chosen randomly as follows: Jerash University from the northern region, applied University from the middle region, and Al-Zaytoonah University from the southern region. The stratified random sampling method was used in sample selection. A total of 320 instructors from the six universities were drawn from the population by reference to Sekaran (2010) who determined sample size from the population.

Research design

Structured questionnaire was used in this research. Respondents were surveyed using five-part questionnaire. Part one concerns with the demographic data for instructors, the demographic data include: Gender, age, internet experience, Frequency of Internet, specialization, university and rank, part two measure e-learning adoption intention, with six items adapted from Lee (2001). Part three measures attitude towards e-learning with five items taken from Ngai et al. (2007). Part four measures the perceived usefulness with seven items developed by Lee (2001) and Pituch and Lee (2006) while Perceived Ease of Use was measured in parts five with four items adapted from Lee (2001) and Pituch and Lee (2006). Questionnaire items were measured on a five point Likert-scale anchored at both extremes to 1 (strongly disagree) and 5 (strongly agree).

Research variables

Dependent variables: behavioral intention to adopt e-learning.

Independent variables:

1. Attitude toward adopting e-learning
2. perceived usefulness
3. Perceived Ease of Use

Statistical treatments

The following statistical tools were used: Means, standard deviations, Cronbach-Alpha formula, and multiple regression.

Measures

The descriptive statistics of the four constructs are shown in Table 1. The standard deviations range from .78 and .91, and all means above midpoint of 2.00

Table 1: Descriptive Statistics

Factors.	Question.	Mean	St.d dev.
BI	BI1	3.0	.80
	BI2	3.2	.82
	BI3	3.1	.80
	BI4	3.4	.83
	BI5	3.3	.81
	BI6	3.2	.82
	Total	3.2	.81
AT	AT1	3.31	.81
	AT2	3.21	.83
	AT3	3.40	.85
	AT4	3.12	.82
	AT5	3.50	.88
	Total	3.31	.84
PU	PU1	3.1	.80
	PU2	3.2	.91
	PU3	3.1	.87
	PU4	3.0	.89
	PU5	3.3	.87
	PU6	3.2	.88
	PU7	3.3	.89
	Total	3.18	.87
PEOU	PEOU1	3.01	.84
	PEOU2	3.21	.78
	PEOU3	3.32	.83
	PEOU4	3.21	.80
	Total	3.19	0.81

Construct validity and reliability have been tested to ensure that the results are reliable and consistent. The reliability analysis measured the internal validity and consistency of items used for each construct. Calculating Cronbach's alpha coefficient tested the factor reliability. This measures the internal consistency by indicating how a set of items are closely related as a group (Moola&Bisschoff, 2012). Nunnally (1978) suggests that a Cronbach alpha value of 0.7 is acceptable, with a slightly lower value might sometimes be acceptable. Cronbach's alpha values for all factors are above 0.7 (see Table 2) indicating that all measures employed in this study demonstrate a satisfactory internal consistency. Therefore, the survey is considered a reliable measurement instrument.

Table 2: Cronbach's Alpha

Scale	Cronbach's alpha
BI	.88
AT	.89
PU	.85
PEOU	.83
Total	.86

Analysis

The hypotheses are tested by the Statistical Package for Social Sciences (SPSS) software. The total number of valid surveys is 238, giving a response rate of around 74.3%.

A regression analysis was conducted to test the first Hypothesis (H1), perceived usefulness (PU) as an independent variable and behavioral intention (BI) as dependent variable. Table 3 below summarizes the result of regression used to test H1.

Table 3: Regression results for H1

	β	Standard Error of β	t	P	R ²
PU	0.305	0.044	5.033	< 0.01	0.235

As seen, perceived usefulness (PU) has significantly influenced behavioral intention (BI) ($P < 0.01$).

Therefore, AT dramatically impacts on BI. Consequently, hypothesis 1 (H1) is supported.

Regarding Hypothesis 2 (H2), the regression analysis shows that perceived usefulness (PU) significantly influences and Attitude (AT) ($P < 0.01$). The results presented in Table 4 indicate that PU significantly influences AT

Table 4: Regression results for H2

	β	Standard Error of β	t	P	R ²
PU	0.404	0.133	3.092	<0.01	0.108

As appears in Table 5, the test of Hypothesis 3 (H3) shows that Perceived Ease of Use (PEOU) has a significant influence on *Attitude (AT)* ($P < 0.01$). Thus, PEOU significantly influences Attitude of instructors (AT).

Table 5: Regression results for H3

	β	Standard Error of β	t	P	R ²
PEOU	0.330	0.057	5.735	<0.01	0.243

Regarding Hypothesis 4 (H4), the regression analysis shows that perceived ease of use (PEOU) significantly influences perceived usefulness (PU) ($P < 0.01$). The results presented in Table 6 indicate that PEOU significantly influences PU.

Table 6: Regression results for H4

	β	Standard Error of β	t	P	R ²
PEOU	0.340	0.058	5.742	<0.01	0.235

Finally, hypothesis 5 (H5) is deemed to be not supported. As Table 8 shows, attitude (AT) has no significant impact on BI ($P > 0.01$).

Table 7: Regression results for H4

	β	Standard Error of β	t	P	R ²
PEOU	0.0.325	0.058	6.064	<0.01	0.235

Table 8 summarizes the results obtained from testing the research hypotheses. The results confirmed that there was a statistical correlation between the predicted directions of the research model. Overall, three of hypotheses were supported by the collected data.

Table 8: Summary of the Hypothesis Testing

Hypotheses	Path	Path coefficient	t-value	Results
H1	PU → BI	0.265	2.234	Supported (P<0.01)
H2	PU → AT	0.504	4.092	Supported (P<0.01)
H3	PEOU → AT	0.330	5.735	Supported (P<0.01)
H4	PEOU → PU	0.340	5.742	Supported (P<0.01)
H5	AT → BI	0.325	6.064	Not Supported (P<0.01)

CONCLUSION

In light of the global trend towards e-learning, the higher education institutions in Jordan have witnessed radical changes in the way they operate (Alshboul, 2011). However, the adoption of e-learning has resulted in several challenges, more particularly users acceptance. The current study using the technology acceptance model (TAM) aimed to predict the acceptance of e-learning by Jordanian students. The findings have clearly revealed several useful implications. As in similar studies (Cheung, Lee & Chen, 2005; Saadeet *al.*, 2007), this work indicated that TAM can be employed as a useful theoretical base to predict and understand users' intentions to use e-learning. It also confirmed that in order to motivate students' intentions to use technology in their learning environment, it is essential to present a positive perception of technology usefulness - particularly as students' attitude may not associate this element with being at a similar level of importance.

From a managerial perspective, e-learning training and improvement helped to focus on how technology could help instructors to develop their performance and effectiveness in learning, rather than on the actual usage of technology. Moreover, while the results demonstrated that perceived usefulness had no significant influence on instructor's attitude, perceived ease of use significantly influenced both attitude and perceived usefulness. Therefore, learning technologists and educational developers should guarantee that e-learning interfaces are user-friendly through regular user engagement during development. Outcomes recommend that this will encourage instructors to more readily identify the benefits of e-learning and explore the opportunities it offers them to improve their performance. Consequently, this will encourage greater participation in e-learning with a positive and creative attitude.

Future studies could be conducted to examine TAM with a different sample of instructors and a wider range of information technology applications. This could involve testing TAM by including the technology actual usage construct in the research model, which could enhance the predictable levels of information technology acceptance by instructors. Finally, the TAM model could be expanded to include additional beliefs that could impact e-learning acceptance such as social influence. Additionally, TAM could be modified by adding antecedents of both perceived ease of use and perceived usefulness. These antecedents should be exclusive to the e-learning.

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