

Faculty Members' Behavior towards Technology Acceptance and its Impact on a Value-Added Configuration

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Abstract

This study focuses on identifying faculty members' behavior toward information systems, measured through the technology acceptance model (TAM), towards the value added from those systems. Data were collected from 56 staff members of the University of Bisha. Path analysis was conducted using reliable measures to enhance understanding of the role of IT usage behavior in creating of value added. The results indicate that some dimensions of ease of use predict faculty members' usage of IT. The perceived ease of use also predicts perceived usefulness. Moreover, the dimensions of faculty members' perceived usefulness and use of IT predict value added. The study's results can be used to help IT designers in education institutions to design better education systems. They can also assist managers of education institutions to align their strategies with IT strategies to add value to faculty staff. The study extends the TAM in the education sector through a comprehensive research model that can be used in other research contexts to evaluate the value added from information systems.

Keywords: Value Added, Ease of Use, Perceived Usefulness, IT Usage, IT Usage Behavior, Technology Acceptance Model

Introduction

Value is the outcome of consumption and experience based on quality and price and is the tradeoff between cost and benefits (LeBlanc and Nguyen, 1999). When an organization creates greater value than its competitors, this will enable it to sustain competitive advantage (Woodruff, 1997). Thus, value is the basis of strategy that enables managers to allocate resources when designing services (Cronin et al., 1997) with the aim of achieving desired results (Cronin et al., 2000).

Information systems offer many capabilities to the user, who can achieve value added by utilizing these capabilities (Fattahi and Afshar, 2006), which change the way people work in many different sectors, including education, where its uses include, for example, collaborative learning (Jackson et al., 2013; Lee, 2010) and e-learning (Ngai et al., 2007).

Scholars offer different views on the value added of information systems, including its dimensions and what factors influence them (Wu et al., 2014; Yu et al., 2013; Ankem, 2010; Emmerich, 2009; Ankem, 2004)

IT applications in education are developed to support learning through collaboration and cooperation. It is important to understand the relevant technology adoption behaviors, since acceptance is a prerequisite for participation, for both faculty members and students (Stantchev et al., 2014). Most studies of IT usage behavior focus on technical and operational issues related to accessing and using systems. Few studies have addressed faculty members' computer usage behavior and its implications for teaching and learning (Gorissen et al., 2012). Whether and how computer usage behavior adds value to faculty members has also been neglected. The staff members' perceived value of IT systems is a sign of their satisfaction as consumers (Kunanusorn and Puttawong, 2015). So, this will lead to design effective strategies for university success (Leiden et al., 2007). Additionally, enable for designing more efficient training programs for faculty members within a limited time and expenditure (Smedley, 2010).

The technology acceptance model (TAM) concerns how computer usage behavior is created, as an indication of IT application success, and whether information systems are useful and valuable to the user (Asiri, 2012; Alharbi and Drew, 2014). The study aims to explain why people use systems based on value added from consumption. To the best of the author knowledge, this is one of fewer studies that explores the impact of computer usage behavior on the value added from IT systems from faculty members' perspective. It seeks to identify the mechanisms through which IT usage behavior is created by exploring the relationships between perceived ease of use, perceived usefulness, and their impacts on IT usage. It also aims to identify how IT usage can add value. The study focuses specifically on the causal explanation for individuals' behavior toward IT in academic settings and the implications in terms of value added to faculty members.

The findings could guide IT designers and managers in higher education institutions in aligning information system objectives with those of the organization. This will inform the creation or improvement of designs for education systems. The findings should also allow them to identify methods for better integrating electronic systems in the teaching process.

Literature Review

What is Information Systems' Value Added?

In 1990s, the value-added concept emerged as a measure of profitability, marking a revision to the formulation proposed by Marshal (1890). Added value can be defined "as the net operating profit minus an appropriate charge for the opportunity cost of all the capital invested in an enterprise" (Worthington, Andrew and West, Tracey, 2001, pp. 76). Thus, value added can be considered a tool for measuring performance, which can be adopted from corporate strategy. There remains mixed evidence on whether value added is superior to traditional performance measurement tools (Sharma and Kumar, 2010).

From the consumer's perspective, value added can be defined in terms of money, quality, benefit, and social psychology (Murthy et al., 2015). Consumer perceived value refers to how the consumer evaluates the characteristics and performance of a product or service (Zeithaml, 2000). With respect to consumer behavior, perceived value is considered an important facilitating factor, representing the overall value estimation of a given object (Gallarza et al., 2011). Thus, it is important to, understand user behavior, such as technology

adoption behavior (Yu et al., 2017). In sum, customer perceived value is multidimensional construct that can be considered as a broad concept of value adds.

The value added of information systems is achieved when users maximize the benefits of using them. Accordingly, there is a need to enhance knowledge about the ways in which more value can be created from information and information systems (Fattahi and Afshar, 2006).

Many models have been constructed to measure the value added from information systems. Taylor's Value-Added Model (1968) has been modified by Eisenberg and Dirks (2008) and Scholl et al. (2011), and renamed as Taylor, Eisenberg, Dirks, & Scholl model (TEDS). The Value-Added Model seeks to explain the users' needs from a system, why they want IT to accomplish a particular task, and how a system meets these needs. On these bases, users' requirements of systems can be better defined (Taylor, 1968).

Many dimensions are used to reflect the value added from information systems. Taylor (1968) proposes: ease of use, noise reduction, quality, adaptability, time-saving, and cost-saving. Due to developing in the information systems Eisenberg and Dirks (2008) renamed the dimensions of Taylor's model, to reflect the relationships among elements which are: user, interface, and system— to user criteria, value added, and system process (Yoo and Park, 2018). Furthermore, Eisenberg and Dirks (2008) added a new sub dimension to the model such as: time-saving and cost-saving, criteria pleasing, listed aesthetics, entertaining, reward, and engaging (Yoo and Park, 2018). Scholl et al. (2011) modified Taylor's (1968) model to assess modern IT applications, concentrating on the relation between actors and usage (Yoo and Park, 2018) through the following dimensions: ease of use, noise reduction, quality, adaptability performance, and affection. These dimensions are divided into thirteen sub dimensions. Modified forms of Taylor's model have been used in the higher education context to evaluate e-learning value added (e.g., Scholl et al., 2014; Scholl, 2015). Hamid (2014) reviewed the following value added to the quality of education information systems: reliable, relevant, and easily accessible information about specific tasks such as a teacher or student, and educational outcome. Moreover, information systems enable cost-efficient and effective education planning, while also helping policymakers to implement plans.

Another way to measure the value added from information systems is the value model designed by Porter (1980), which modified by Cisco and Strong (1999). This model is based on the following assumption: "information produces knowledge in the production line which required the input, capture, filtering, organization, sharing and use and synthesis of many forms of information, data and documents." (Cisco and Strong, 1999). This model is process-oriented, whereas Taylor's model focuses on user needs, which is better suited for information and document management (Nabavi and Jamali, 2015), and evaluating how the objectives of information systems satisfy user needs (Yoo and Park, 2018), and it cannot be applied for customization of information management processes based on user preferences (Nabavi and Jamali, 2015).

Nabavi and Jamali (2015) argue that existing value-added models are not comprehensive and do not distinguish between the various aspects of value added. Moreover, Palmquist (2005) contends that the value model has not been empirically tested.

Technology Acceptance Model

The TAM was first designed by Davis (1989) as a theoretical framework for describing computer usage behavior; it is usually employed to explain individual decisions toward using and adopting IT. It also guides managers in making decisions to increase the effectiveness and

acceptance of using IT (Al-Gahtani, 2014). The TAM can be extended and applied any type of technology and business context (Lee et al., 2003), such as e-learning (Tarhini et al., 2013; Handoko, 2019), e-commerce (Yoon, 2009; Wu and Wang, 2005), hospitality and tourism (Casalo et al., 2010; Chang and Caneday, 2011; Kim and Niehm, 2009), and learning (Wan Ismail et al., 2012). The model is based on the theory of reasoned action ((Hill, Fishbein & Ajzen, 1977)) to explain the reasons for accepting or rejecting information technology by the user. Some scholars have used motivational theory alongside TRA to explain the influence of extrinsic and intrinsic motivations for behavior of the user (Lee et al., 2005) Others have used the theory of planned behavior, to explore the influence of social factors on technology adoption, and the unified theory of acceptance and use of technology, which is attempting to unify the earlier theories that explain adoption behavior (e.g., Venkatesh et al., 2003).

As proposed by Davis (1996), the TAM uses the following main components to explain human behavior towards IT application: perceived ease of use, perceived usefulness, and IT usage. The model indicates that if IT systems are easy to use and users recognize their usefulness, this will enable users to capture the benefits of using these systems. The TAM has undergone many modifications since its initial formulation to enable the prediction of user behavior in different fields, whether commercial or otherwise (Venkatesh et al., 2012). For example, Venkatesh and Davis (1996) added the user's objective in using IT systems as a determinant of use, in terms of computer self-efficacy. The TAM has also been modified by many scholars to increase efficiency in predicting user behavior (Venkatesh et al., 2003; Venkatesh et al., 2012). For instance, Venkatesh and Bala (2003) and Baker et al. (2010) designed the TAM3, which includes the following determinants of perceived ease of use and perceived usefulness: individual differences, system characteristics, social influence, and facilitating conditions.

Despite these modifications in the model, some scholars conclude that the three original dimensions of the TAM can best explain the usage behavior of electronic systems, namely, perceived ease of use, perceived usefulness, and IT usage (Hong and Walker, 2015). In some previous studies, TAM scale has been adapted to fit education settings with the inclusion of additional items, such as technical support, computer self-efficacy, media richness, and flow (Del Barrio-García et al., 2015).

TAM have many applications such as explore how user perceptions influence the value that could be generated from information systems, for example satisfaction, performance, and learning outcomes (Ibrahim and Leong, 2012). The applications of TAM have been used widely in education context (Saadé and Bahli, 2005; Al-Gahtani, 2014; Handoko, 2019). The results of previous applications of the TAM in educational contexts indicate that it provides a useful theoretical basis for predicting and understanding, intention to use technology (Hong and Walker, 2015).

Value added and TAM

Some scholars have investigated the effects of IT usage on the value added from information systems (Sandler, 2010). Nabavi and Jamali (2015) consider the value added from information systems to be solely the outcome of how a user utilizes the system: that is, value added derives from manipulating data/information or refining system algorithms. Many researchers have investigated the impact of an IT application's acceptance (as a measure of behavior towards using computer systems) on the perceived value. These study results indicate that perceived usefulness influences perceived value (Yang et al., 2016; Yu et al., 2015).

Accordingly, the TAM can be used as a framework to test how computer usage behavior impacts on the value added to faculty members, To the best of the author' knowledge, while a few studies have investigated the impact of computer usage behavior on the value added from educators' perspective, none have used the TAM (Algiers and Silva- Fletcher, 2015).

Research model and hypotheses and methods:

Hypotheses

IT usage and value added

According to Fattahi and Afshar (2006), information systems provide many capabilities to the user that, if utilized, will probably add value to them. Moreover, Taylor (1968) and Eisenberg and Dirks (2008) indicate that information systems add value to the user if user wants and needs are satisfied by using those systems. Accordingly, the following hypothesis is proposed:

H1: IT usage has an impact on the value added to faculty members

Perceived usefulness and valued added

Many studies indicate that perceived usefulness has an impact on perceived value (e.g., Kim et al., 2008; Yu et al., 2017). Thus, the following hypothesis is proposed:

H2: Perceived usefulness has an impact on the value added to faculty members.

Ease of use and value added

According to Taylor (1986) and Scholl et al. (2011), information systems' value added can derive from their perceived ease of use. Accordingly, the following hypothesis is proposed:

H3: Perceived ease of use has an impact on value added to faculty members.

Perceived ease of use and perceived usefulness

According to Saadé and Bahli (2005) and Mensah (2016), perceived ease of use influences perceived usefulness. This relation has been found to hold for education learning systems (Ong and Lai, 2006; Alharbi and Drew, 2014). Accordingly, the following hypothesis is proposed:

H4: Perceived ease of use has an impact on perceived usefulness.

Perceived usefulness, perceived ease of use, and IT usage

According to Mensah (2016), the perceived usefulness and ease of use of technology are each related to how intensive information systems are used. Thus, the following hypotheses are proposed.

H5: Perceived usefulness has an impact on IT usage.

H6: Perceived ease of use has an impact on IT usage.

The hypotheses are illustrated in figure 1

Figure 1. Research model

Methodology

Measurement

The TAM used in this study is based on Davis's (1989, 1993) original conception work, founded on the TRA. Following prior research, it includes three acceptance constructs: perceived ease of use, perceived usefulness, and IT usage (Selim, 2003; Atkinson and Kydd, 1997; Lederer et al., 2000; Venkatesh and Davis, 2000), which satisfied maximum validity (Burton-Jones and Hubona, 2005). Some items of the study's model are borrowed from previous studies in educational settings to increase its predictive power (e.g. Igbaria and Tan, 1995; Burton-Jones and Hubona, 2005). To tailor the model to the context of Saudi Arabia and the University of Bisha, some items are added, and some removed.

As the aim is to evaluate the value added to faculty members as IT users, the most suitable model is Taylor's (1968) user-oriented model, which can be used to evaluate a variety of information system processes (Yoo and Park, 2018). The modifications to the model by Scholl et al. (2014) and Scholl (2015) enable its use to evaluate internet technology. Accordingly, the value-added items are based on Taylor's (1968) model, as modified by Eisenberg and Dirks (2008) and used by (Kuo et al., 2009), with some items adapted from Fattahi and Afshar (2006), and Nabavi and Jamali (2015).

Since all the research items are borrowed from previous studies, they were checked by several management professors at the University of Bisha to ensure their reliability and applicability to the Saudi context. Table 1 summarizes the variables used in the study and the supporting literature.

Table 1 Summary of study variables and supporting literature

Item	Description	Dimensions	Supporting literature
IT usage	A behavioral response measured by the individual's actions.	- Internet usage - Blackboard usage	Davis (1989), Stewart <i>et al.</i> (2010)
Perceived ease of use	The degree to which a person believes that using a particular system would require little effort.	- Skill in use - Ease and quality of use - Ease of learning	(Davis, 1989); Johnson (2010), AlQudah (2014); Stantchev <i>et al.</i> (2014)
Perceived usefulness	The degree to which a person believes that a system can improve their work performance.	- Benefits relating to presenting information - Benefits relating to effectiveness and improving performance and productivity.	Davis (1989); AlQudah (2014); Tella (2011); Cheong and Park (2005)
Value added	The ability of electronic services offered by the university to deliver benefits for users.	- Adaptability and flexibility - Quality - Time reduction and fast delivery - Confidentiality and safety	Tella (2011); Fattahi and Afshar (2006); Taylor (1968); Eisenberg and Dirks (2008); Kuo <i>et al.</i> (2009);

			Nabavi and Jamali (2015);
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Population and Sampling

The study focuses on the University of Bisha in Saudi Arabia. Data were gathered from only three colleges, which is a relatively small sample. The sample size reflects the difficulty of collecting data from all the university's many branches. The study population is homogeneous in some respects, particularly the level of education.

The sample only includes faculty members available at work at that time, because some may be sent for postgraduate studies. According to University of Bisha statistics, the number of faculty members is 140. In total, 64 questionnaires were collected from them. Some responses were excluded for not completing, leaving 54 valid questionnaires.

Of the valid sample, 37.7% were female and 86.95% aged 30 years and over. In terms of job role, 13.1% were teaching assistants and lecturers, 75.4% are assistant professors, and 11.5% were associate professors. The distribution by academic department was as follows: 24.6% management studies, 4.95% information systems, 6.6% Islamic studies, 4.9% engineering, science, 6.6% home economics, 13.1% education, 3.35% computer science, 9.8% medical science, 3.3% science, 4.9% mathematics, 6.6%, English, 8.2% psychology, and 2.2% other. Time at the university was up to five years are 59%, six to 10 years for 34.45%, and more than 10 years for 6.5%. The distribution by college was as follows: 16.4% from Tathleeth College of Art and Science, 21.3% from the College of Education, and 62.3% from the College of Art and Science for Boys.

Results

Factor Analysis

An exploratory factor analysis was conducted to investigate the underlying structure of the scale's dimensions, to ensure construct validity, and to reduce the number of variables. Varimax factor analysis is used in this study following Klien's (2005) procedure, which indicates that a factor loading above 0.6 is acceptable. The factor analysis of faculty members' actual IT usage indicates that there are two dimensions of actual usage: computer use and blackboard use. The of factor analysis for perceived ease of use identify five factor solutions. The first includes four items from the ease and quality of use, and one item from ease of learning. Thus, this factor will retain the name of ease of use. The second factor includes three items from ease of learning, and so is termed ease of learning. The third factor comprises four items from ease and quality of use, and so is named quality of use. The fourth factor includes three items from skill in use, and so is termed skill in use. The fifth factor does not meet the analysis requirements of factor analysis (factor loading less than 0.65).

The results of factor analysis of the items of perceived usefulness were loaded on two factors. The first is benefits relating to presenting information, and the other is benefits relating to effectiveness and improving performance and productivity.

Factor analysis for value added to identify three factors. The first contains items from adaptability and flexibility, and so is named thus. One item is removed as it does not satisfy (factor loading less than 0.65). The second factor contains items from the dimensions of quality and time reduction and fast delivery. One quality dimension item is removed as it does not satisfy the requirements of factor analysis (factor loading less than 0.65). This factor is termed quality. The third factor contains items from the confidentiality and safety dimension and is thus termed confidentiality and safety.

Construct Validity and Confirmatory Factor Analysis

This study uses partial least squares (PLS) to examine the research model because it seeks to explain how faculty members' behavior toward IT in an education setting causes the value added from these systems, PLS is, therefore, preferred to multiple regression analysis (Al-Gahtani, 2014).

First, confirmatory factor analysis was conducted to validate the measurement model, as suggested by Ringle et al. (2005). Following Chin (1998), any item with a factor loading below 0.4 is deleted. Moreover, to verify convergent validity, composite reliability (should be higher than 0.5) was calculated. Reliability was checked using Cronbach's alpha, with values above 0.7 considered acceptable, as suggested by Hair et al. (2017). After removing items that do not satisfy the PLS-SEM algorithm requirements of the reliability and validity, the results of these tests are presented in Table 2.

Table3. Discriminant validity

Construct	Composite reliability	Cronbach's alpha	Table 2. Reliability and Construct Validity Factor loading
Actual IT usage			
Computer use	0.884	0.828	
COMU1			0.831
COMU2			0.898
COMU3			0.757
COMU4			0.748
Blackboard use	0.968	0.963	
BLAKU1			0.764
BLAKU2			0.872
BLAKU3			0.895
BLAKU4			0.906
BLAKU5			0.874
BLAKU6			0.919
BLAKU7			0.883
BLAKU8			0.887
BLAKU9			0.816
BLAKU10			0.847
Perceived ease of use			
Skill in use	.891	0.820	
SU1			0.842
SU3			0.914
SU4			0.808
Ease of use	0.899	0.894	
EAQ1			0.709
EAQ2			0.852
EAQ3			0.826

EAQ4			0.861
EAQ5			0.756
Quality of use	0.884	0.824	
EAQ6			0.853
EAQ7			0.941
EAQ8			0.806
Ease of learning	0.891	0.817	
EL1			0.922
EL2			0.795
EL3			0.845
<i>Perceived usefulness</i>			
Benefits relating to presenting information	0.924	0.896	
BID1			0.754
BID2			0.862
BID3			0.836
BID4			0.878
BID5			0.873
Benefits relating to effectiveness and improving performance and productivity	0.916	0.882	
BPP1			0.791
BPP2			0.892
BPP3			0.929
BPP4			0.808
<i>Value added</i>			
Adaptability and flexibility	0.955	0.935	
ADF2			0.891
ADF3			0.952
ADF4			0.933
ADF5			0.883
Quality	0.955	0.945	
QU1			0.761
QU2			0.834
QU3			0.887
QU4			0.845
TIMED1			0.886
TIMED2			0.860
TIMED3			0.889
TIMED4			0.842
Confidentiality and safety	0.958	0.941	
COSA1			0.808
COSA2			0.962
COSA3			0.964
COSA4			0.948

	Item	1	2	3	4	5	6	7	8	9	10	11
1	Blackboard use	0.867										
2	Computer use	0.212	0.811									
3	Adaptability and flexibility	0.365	0.02-9	0.915								
4	Quality of use	0.447	0.100	0.404	0.868							
5	Quality	0.522	-0.072	0.719	0.404	0.852						
6	Confidentiality and safety	0.275	-0.166	0.606	0.333	0.721	.0923					
7	Benefits relating to effectiveness and improving productivity and performance	0.333	0.139	0.600	0.325	0.629	.0608	0.856				
8	Benefits relating to presenting information	0.332	0.022	0.620	0.595	0.648	.0525	.0579	0.842			
9	Skill in use	0.07-5	0.402	0.126	0.078	0.0355	.0009	.0289	0.022	0.856		
10	Ease of learning	0.052	0.096	0.253	0.356	0.173	.0292	.0289	-0.016	0.291	0.855	
11	Ease of use	0.459	0.065	0.689	0.657	.0505	.0366	.0381	.0475	.0076	.0371	0.803

Discriminant validity was tested to ensure that all constructs differ from each other. The results of this analysis are shown in Table VII. Following the rule of thumb for discriminant validity of Fornell and Larcker (1981, pp. 45-46) and Hair et al. (2006, p. 778), the “square root

of AVE values of each construct should be higher than all of the correlation values of the construct.” The results shown in Table 3 verify the model’s discriminant validity.

Path Analysis

Path analysis is conducted using Ringle *et al.*’s (2005) SmartPLS Guide and Chin’s (1998) bootstrap re-sampling method to test the statistical significance of each path coefficient. Table 4 shows the results of this analysis.

Table 4. Path analysis

Relations	Original sample	Sample mean	Standard deviation	t-statistic	p-value
BLAKU × ADF	0.127	0.119	0.130	0.974	0.330
BLAKU × QU	0.323	0.314	0.125	2.592	0.010***
BLAKU × COSA	0.088	0.061	0.164	0.538	0.591
COMU × ADF	-0.146	-0.142	0.143	1.018	0.309
COMU × QU	-0.210	-0.207	0.120	1.757	0.080*
COMU × COSA	-0.132	-0.118	0.115	1.1148	0.252
EAQ × BLAKU	0.355	0.285	0.248	1.412	0.1530
EAQ × COMU	0.106	0.040	0.314	0.339	0.735
EAQ × ADF	-0.228	-0.256	0.176	1.297	0.195
EAQ × QU	0.005	0.009	0.167	0.029	0.977
EAQ × COSA	-0.132	0.121	0.202	0.596	0.551
EAQ × BPP	0.150	0.156	0.173	0.861	0.389
EAQ × BID	0.497	0.500	0.153	3.255	0.001***
BPP × BLAKU	0.329	0.329	0.171	1.926	0.055*
BPP × COMU	0.122	0.125	0.211	.0577	0.564
BPP × ADF	0.232	0.225	0.172	1.349	0.178
BPP × QU	0.311	0.317	0.131	2.378	0.018**
BPP × COSA	0.408	0.418	0.182	2.250	0.025**
BID × BLAKU	-0.208	-0.165	0.219	0.947	0.344
BID × COMU	-0.148	-0.121	0.322	.0459	.0646
BID × ADF	0.412	0.416	0.166	2.483	0.0131**
BID × QU	0.339	0.333	0.174	1.950	0.052*
BID × COSA	0.328	0.296	0.189	1.737	0.083*
SU × BLAKU	-0.135	-0.124	0.129	1.048	0.295
SU × COMU	0.453	0.431	0.173	.2619	0.009***
SU × ADF	0.078	.0119	0.131	.0592	0.554
SU × QU	0.034	0.036	0.132	0.254	0.800
SU × COSA	-0.118	-0.116	0.145	0.810	0.418
SU × BPP	0.237	0.217	0.146	1.517	0.130
SU × BID	0.054	0.062	0.120	0.450	0.653
EL × BLAKU	-0.281	-0.244	0.181	1,543	0.12
EL × COMU	-0.331	-0.313	0.219	1.513	0.131
EL × ADF	0.106	0.135	0.175	.0608	0.544
EL × QU	0.028	0.026	0.131	0.208	0.835
EL × COSA	0.236	0.231	0.176	1.342	0.180

EL × BPP	0.077	0.090	0.151	0.514	0.607
EL × BID	-0.310	-0.271	0.151	2.050	0.041**
EAQ × BLAKU	0.313	0.328	0.191	1.640	0.102
EAQ × COMU	0.178	0.158	0.197	0.904	0.367
EAQ × ADF	0.383	0.373	0.152	2.519	0.012**
EAQ × QU	0.107	0.091	0.162	0.658	0.511
EAQ × COSA	0.031	0.33	0.153	0.204	0.838
EAQ × BPP	0.236	0.233	0.176	1.3410	0.180
EAQ × BID	0.258	0.224	0.152	1.707	0.088**

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results indicate that some hypotheses are partially supported at the $p < 0.1$ and some are significant at the $p < 0.05$. First: hypothesis one is partially supported; as the relationship between COMU and QU (at $p < 0.1$); as well as the relationships between BLAKU and QU are significant (at $p < 0.01$). Second: hypothesis two is partially supported due to significant relations among the following items: BID and COSA; BID and QU (at $p < 0.1$) BID and ADF; BPP and COSA; and BPP and COSA (at $p < 0.05$). Third: hypothesis three is partially supported, because the relationship EAQ and ADF is significant (at $p < 0.05$). Fourth: hypothesis four is partially supported as the relationship between EL and BID as well as EAQ and BID are significant at $p < 0.05$. Fifth: hypothesis five is partially supported as BPP and BLAKU is significant (at $p < 0.1$). Six: hypotheses six is partially supported as SU and COMU as well as the EAQ and is significant (at $p < 0.01$)

From the results of analysis, it can be concluded, perceived usefulness of the user predicts value added, and both computers use, and blackboard use predict value added from quality dimensions. In addition, the perceived ease of use dimensions predicts benefits relating to presenting information, as well as adaptability and flexibility. Furthermore, the dimensions of ease of use predict of benefits related to improving performance and productivity. Moreover, of ease of use dimensions predict computer usage. While, perceived usefulness dimensions predict of computer usage.

Discussion

The results of this study confirm that some dimensions of perceived ease of use (skill in use) and of perceived usefulness (Benefits relating to effectiveness and improving performance and productivity) influence faculty members' use of IT. This supports some previous findings, such as those of Mensah (2016). Accordingly, as the staff members recognizing that it is easy for them to become skillful in using the electronic systems and benefiting from using the systems, they will use the system. Thus, the higher education institutions should focus on giving the necessary supports to faculty members in terms of technical support and training programs necessary for staff members not only include how to become skillful in using the systems but also how to benefit from using the systems, which can be supported by reward programs. The results partially support hypotheses H5 and H6, thus, Future research should focus on the mediator and moderate factors that impact the relationships between perceived ease of use and perceived usefulness and use of electronic systems.

The finding that perceived ease (perceived easy to get skill in using electronic systems) predicts perceived usefulness confirms the prior findings of Saadé and Bahli (2005) and

Mensah (2016). In the education sector, this indicates as the faculty members precept that if it easy to become a skill in using computer systems this will enable them to perceive the usefulness of using the systems. Thus, the IT designer has to take into consideration the degree of the skill of the staff members when designing the systems. Additionally, providing the necessary training programs to leverage the skill of the staff members necessary for using the systems, and make the necessary technical support when needed.

Perceived ease of use is found to contribute to explaining how faculty members create value-added from information systems in terms of adaptivity and flexibility. This contradicts with Du, Zhu, Lv & Sun (2012). This means staff members value the functionality and usability of information systems. This means as the staff members perceived that electronics systems are easy to uses this enables them to gain flexibility in doing their work with the students and interact with them. Thus, the mangers of higher educations should focus on training the staff and give them suitable technical supports so as to make the electronic system's ease of use.

IT usage (blackboard usage) contributes to explain how the faculty members add the value of information systems (quality). The results indicate when faculty members use blackboard applications in their work this will enable them to achieved gain quality in some of the outputs that required from their students such as the ability to depends on themselves in solving problems electronically. This indicates that if frequently the user uses information systems this is an indication of perceived value. This confirms with Vlahos et al. (2004). Future researches should focus on finding explanations of, why staff members could not gain all dimensions of the value-added from using the systems. IT designers and IT managers of higher education's institutions, must align the organizational objectives with IT strategies to design blackboard systems that help staff members users to gain the value that not achieved in this study such, and Adaptability and flexibility.

Perceived usefulness (Benefits relating to presenting information) is a predictor of value-added from using information systems (Confidentiality and safety) this confirms with Yu et al. (2017). This indicated some dimension of perceived usefulness is a predictor of value-added. Future research should focus on other Saudi universities, and other worldwide universities in order to investigate if other dimensions of perceived usefulness can be a predictor of value add from electronics systems and the conditions under which it can be created.

Collectively, the results of the study show how all the dimensions of TAM models predict the value-add from electronic systems in higher education systems. This can be the basis of developing the theory that can predict how to create value add for using electronics in the context of higher educations.

Practical Implications

This study extends the application of value added in the education sector by developing a theoretical model based on faculty members' value added. By empirically testing the proposed model, the study elucidates the acceptance of IT in education. Previous studies focusing on higher education lacked a comprehensive approach to value added and IT usage behavior from faculty members' perspective. Thus, this study enhances understanding of the creation mechanism for value added in this context.

Finally, this study showed that IT usage behavior is a clear antecedent for value added. Its proposed framework can be applied to future studies on the impact of IT usage behavior on value. The study also confirms the applicability of the TAM in testing IT usage behavior in education.

Managerial Implications

The study's results can be used to help IT designers in education institutions to design effective education systems, based on the value they want to create. The managers of higher education institutions should align their strategies with IT strategies to add value to faculty, staff, thereby enabling better integration of electronic systems and the teaching process.

Limitations

The main limitation of this study is the small sample size and focusing only on one university in Saudi Arabia. Moreover, the study does not specify which factors may affect the relationships between IT usage behavior and value added.

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