**THE STUDENTS’ ACCEPTANCE OF LEARNING MANAGEMENT SYSTEMS IN SAUDI ARABIA: A CASE STUDY OF KING ABDULAZIZ UNIVERSITY**

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**Abstract**

The Technology Acceptance Model (TAM) has become one of the most widely-used models in understanding user acceptance of technologies and has been employed in many empirical studies. However, TAM has barely been used within the context of Saudi Arabia to understand the students’ acceptance of learning management systems (LMS). This quantitative study draws on the TAM to assess the acceptance of LMS (Blackboard) at King Abdulaziz University (KAU) from the perspectives of Saudi students. All participants were students at KAU during the 2016 Fall semester from different disciplines and colleges. To ensure a sufficient sample size, the survey was distributed to students both online and manually. From 150 survey participants 142 responses were used for data analysis. The findings demonstrate the original TAM hypotheses. Students’ actual use is influenced by the behavioral intention that is affected by students’ attitude and perceived usefulness. The perceived ease of use has an impact on the students’ attitude and perceived usefulness alike. Student acceptance of learning management technology has not yet been fully explored in the Saudi context. This study’s findings offer some reassurance that LMS technology, new to Saudi higher education, might play an important part in future students’ learning.

Keywords: Technology Acceptance Model, learning management system, TAM, King Abdulaziz University, LMS, e-learning system.

# INTRODUCTION

The development of information and communication technologies (ICT) led to the employment of technologies to enhance education in academic institutions. The term e-learning emerged in the field of education to capture learning achieved through, or facilitated by, online systems. Certainly, e-learning cannot be delivered without the employment of technologies. Hsieh in [1] reported that learning management systems (LMS) are the most popular method for delivering e-learning.

Because of the various advantages of e-learning systems, the majority of higher educational institutions in Saudi Arabia have adopted LMSs [2]. The system incorporates tools for managing and facilitating the activities of learning and teaching [3]. Usually, the LMS consists of various tools and features such as content management tools, communication tools, assignment submission tools and student evaluation tools [4]. Li and Lee have stated in [5] that this online environment facilitates the accessibility and exposure to education in the era of advanced technologies.

LMS have been worldwide phenomenon in higher education. 99% of educational institutions have adopted LMS, 85% of teachers use LMS and 83% of students use LMS [6]. The context of Saudi Arabia is no exception. Aljuhney and Murray conducted a study to investigate the utilization of LMS in 46 higher educational institutions in Saudi Arabia [2]. The study concluded that the majority of the higher educational institutions (87%) have been using LMS. However, having access to an LMS does not in itself answer one of the important questions in Saudi Arabia, namely “Are LMS accepted by Saudi students?”. This study attempts to answer this question by evaluating the acceptance of the LMS within the context of Saudi Arabia. The study follows the TAM constructs to investigate the perspectives of Saudi students.

The structure of the paper is organized as follows: First, the study context is described briefly. After explaining the ideas behind TAM, the proposed research model is displayed. Then the methodology section explains the approach. The study findings are presented prior to the discussion and conclusion sections.

# STUDY CONTEXT

King Abdulaziz University (KAU) was chosen to represent higher educational institutions in Saudi Arabia due to its large size (KAU has more than 180,000 students [7]), high academic ranking, being well established and its appropriate localization. KAU was the first university in Saudi Arabia to adopt online learning by the establishment of the Deanship of Distance Learning in 2006 [8]. Further, KAU in 2016 retained the 23rd place between the top 50 universities under 50 years old [9]. All the above made KAU eligible to represent the context of Saudi Arabia.

# TECHNOLOGY ACCEPTANCE MODEL

The acceptance of technologies and systems has been studied through various theories and frameworks, such as the theory of reasoned action (TRA) [10], technology acceptance model (TAM) [11], extended technology acceptance model (TAMs) [12] and the unified theory of acceptance and use of technology (UTAUT) [13]. However, TAM is one of the widely-used models in understanding the acceptance of technologies and has been employed in many empirical studies [14, 15, 16, 17, 18]. In 1989, TAM was designed by Fred Davis with the objective of producing a theoretical framework based on TRA to measure users’ acceptance of new technologies [11]. TAM explains the relationship between users and technologies to estimate the user’s acceptance of the technology [19].

TRA was extended to produce TAM [11]. Subsequently TAM2 [12] and UTAUT [13] were produced as extensions of TAM. According to TRA, the actual behavior is impacted by the behavioral intention to use the technology, which is influenced by users’ attitude and subjective norms [10]. Unlike TAM, the acceptance of new technologies in UTAUT can be measured by assessing 4 determinants: performance expectancy, effort expectancy, social influence and facilitating conditions [13]. The majority of acceptance and usage theories have failed to combine the psychological and technical constructs into one theory; however, TAM has succeeded in combining variables from both aspects [19].

Primarily, TAM consists of 5 constructs (Fig. 1) [11]. According to TAM, the acceptance of new technologies can be measured by assessing 4 determinants: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward use (ATU) and behavioral intention to use (BIU). PEOU can be defined as the extent to which someone believes that utilizing LMS would be free of cognitive effort, and PU can be defined as the extent to which someone believes that utilizing LMS would improve his or her performance [11]. Fig. 1 depicts that the actual use of systems (AU) is directly influenced by BIU, that is affected by both ATU and PU. ATU is directly influenced by PU and PEOU alike. PEOU defines PU directly, and both PEOU and PU are influenced by external variables. TAM provides users’ cognitive, affective and behavioral responses toward systems and technologies [19]. PU and PEOU represent cognitive responses, ATU represents affective responses and BIU represents behavioral responses of users.



Fig. 1. Technology Acceptance Model (TAM) [11]

# RESEARCH MODEL

Based on TAM, 6 hypotheses were proposed to investigate the acceptance of LMS from the perspectives of Saudi students. Fig. 2 depicts the proposed research model. To test the influence of TAM constructs, the following hypotheses were proposed:

**H1:** Students’ PEOU positively influences their PU.

**H2:** Students’ PEOU positively influences their ATU.

**H3:** Students’ PU positively influences their ATU.

**H4:** Students’ PU positively influences their BIU.

**H5:** Students’ATU positively influences their BIU.

**H6:** Students’ BIU positively influences their AU.



Fig. 2. The Proposed Model

# METHODOLOGY

The methodology section primarily considers the method used for collecting data. The survey instruments, demographic information, sample and participants are introduced in this section. Moreover, the data analysis is briefly described.

## Data Collection Method

As TAM is quantitative in nature, the decision was made to use an online survey for data collection [15, 20, 21, 22]. Online surveys primarily depend on the Internet for gathering data. Althobaiti and Mayhew have reported that surveys are highly convenient for the assessment of e-learning systems [4]. Due to affordability, time constraints and flexibility, Google Forms was used as the online tool for data collection. However, only 31 responses were received within the period of 3 weeks. Therefore, the decision was made to distribute the survey manually. In total, 150 responses were collected, and 142 complete responses were used for data analysis.

## Instrument

The instrument of the study comprises 2 sections. The first section describes the participants’ demographic information and consists of 6 questions: age, gender, prior experience with LMS, education level, field of study and GPA (Table 1). The second section includes TAM constructs with 24 items (Table 3) and can be answered using 7-point Likert scale, where 1 means strongly disagree and 7 means strongly agree [21, 15, 17, 18, 19, 22]. The constructs consist of PEOU (5 items), PU (5 items), ATU (5 items), BIU (5 items) and AU (4 items). To ensure the reliability and validity, the 24 items were adopted mainly from previous literatures [22, 20, 16, 15]. All of the measures were close-ended questions [21, 16, 18].

It is worth mentioning that the survey was prepared in English and reviewed by 2 native English speakers to ensure the instrument is free of wording issues. In the second step, the Arabic version of the survey was prepared since the majority of students at KAU speak Arabic. As the back translation method was used [22], the Arabic version was reviewed by 2 bilingual speakers.

Table 1. Demographic Information

|  |  |
| --- | --- |
|  | **Questions** |
| 1 | Gender:   * Male * Female |
| 2 | Age: ( ) |
| 3 | Experience with Blackboard:   * Less than 1 year * 1-2 year * More than 2 years |
| 4 | Education level:   * Diploma * Bachelor * Master * PhD |
| 5 | Field of Study:   * Medical Sciences * Applied Sciences * Natural Sciences * Humanities and Social Sciences |
| 6 | GPA: ( ) |

## Data Analysis

After the completion of the data collection stage, the responses were transformed to SPSS Statistics 20 for further statistical tests. The internal consistency of the TAM constructs was measured using Cronbach’s alpha [19, 22]. Linear Regression Analysis was used to examine the proposed model [23]. Furthermore, the Spearman rank correlation test was employed to examine the correlations between the 5 constructs of TAM [22].

# FINDINGS

In this section, the results of the study are presented. The findings include demographic information, descriptive statistics, instrument reliability, correlations between constructs and hypotheses testing.

## Demographic Information

The participants’ demographic information is summarized in Table 2. 123 students (86.6%) are male, and 19 students (13.4%) are female. The majority of the participants (66.9%) are between the age of 21 and 25 years old. All participants have at least 1 year of experience with LMS. The study includes participants from different education levels and fields.

Table 2. Participants’ Profiles

|  |  |  |
| --- | --- | --- |
| **Item** | **Frequency** | **Percentage** |
| **Gender:** | | |
| Male | 123 | 86.6 |
| Female | 19 | 13.4 |
| **Age:** | | |
| < 21 | 28 | 19.7 |
| 21 - 25 | 95 | 66.9 |
| 26 - 30 | 11 | 7.7 |
| > 30 | 8 | 5.6 |
| **Experience with Blackboard:** | | |
| < 1 year | 70 | 49.3 |
| 1 - 2 years | 48 | 33.8 |
| > 2 years | 24 | 16.9 |
| **Education level:** | | |
| Diploma | 19 | 13.4 |
| Bachelor | 104 | 73.2 |
| Master | 16 | 11.3 |
| PhD | 3 | 2.1 |
| **Field of Study:** | | |
| Medical Science | 21 | 14.8 |
| Applied Science | 48 | 33.8 |
| Natural Science | 22 | 15.5 |
| Humanities and Social Sciences | 51 | 35.9 |
| **GPA:** | | |
| 0 – 2.99 | 16 | 11.3 |
| 3 – 3.99 | 66 | 46.5 |
| 4 - 5 | 60 | 42.3 |

## Descriptive Statistics

Table 3 summarizes the descriptive analysis of the participants’ responses for the 24 items. All the mean values are above 4.47, which proves that the participants have positive assessments for LMS. The standard deviation values are within the range of 1.245 and 1.916, which indicate that the data is close to the mean.

Table 3. Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Construct** | **Measure** | **Mean** | **SD** | **Cronbach’s alpha** |
| Perceived Ease of Use (PEOU) | It is easy to learn how to use Blackboard. | 5.68 | 1.297 | .893 |
| It is easy to become a skillful at using Blackboard. | 5.52 | 1.281 |
| It is easy to operate Blackboard. | 5.51 | 1.372 |
| Blackboard is flexible to interact with. | 5.00 | 1.492 |
| Overall, Blackboard is easy to use. | 5.53 | 1.372 |
| Perceived Usefulness (PU) | Blackboard would enable me to achieve tasks more quickly. | 5.30 | 1.530 | .875 |
| Using Blackboard would improve my learning performance. | 4.75 | 1.595 |
| Using Blackboard would help me learn effectively | 4.96 | 1.667 |
| Using Blackboard would make it easier to achieve learning tasks. | 5.37 | 1.657 |
| Overall, Blackboard is useful. | 5.75 | 1.395 |
| Attitude toward Usage (ATU) | I believe it is good to use Blackboard. | 5.72 | 1.268 | .914 |
| I like the idea of using Blackboard. | 5.45 | 1.461 |
| Using Blackboard is a positive idea. | 5.80 | 1.245 |
| I enjoy using Blackboard. | 4.75 | 1.625 |
| Overall, I have a good attitude toward Blackboard. | 5.26 | 1.524 |
| Behavioral Intention to Use (BIU) | I would like to use Blackboard in the future if I have the chance. | 5.30 | 1.553 | .934 |
| I would like to use Blackboard in all future courses. | 5.06 | 1.865 |
| I would recommend using Blackboard to others. | 5.19 | 1.650 |
| I would encourage my teachers to use Blackboard in courses. | 5.27 | 1.721 |
| I will continue using Blackboard in the future. | 5.13 | 1.734 |
| Actual Use (AU) | I use Blackboard frequently. | 4.48 | 1.916 | .851 |
| I tend to use Blackboard for as long as is necessary. | 5.54 | 1.442 |
| I have been using Blackboard regularly. | 4.47 | 1.844 |
| I usually get involved with Blackboard. | 4.49 | 1.882 |

## The Reliability of the Instruments

The reliability of TAM has been proven widely [14]. The reliability of an instrument is the internal consistency or the instrument ability to generate the same findings under the same situations [24]. Although many studies [22, 15, 16, 25] have demonstrated the high reliability of TAM, the reliability test of the survey instrument was conducted for the study in hand. Cronbach’s alpha test has been used widely to examine the reliability of instruments [26]. For example, Cronbach’s alpha values were between 0.801 and 0.924 in [22], 0.90 and 0.97 in [15], 0.718 and 0.858 in [25] and 0.904 to 0.914 in [16]. Cronbach’s alpha was also employed to assess the internal consistency of this study. Table 3 indicates that the Cronbach’s alpha value is within the range of .851 and .934. The overall alpha value for the instrument is 0.957. As the reliability of measures is acceptable when Cronbach’s alpha value is greater than 0.7 [27], the findings demonstrate the high reliability of the survey instruments.

## Correlations between Constructs

The correlations between the TAM constructs was examined using the Spearman rank correlation test [22]. Table 4 summarizes the results of the correlations between PEOU, PU, ATU, BIU and AU. All examined constructs are associated with each other. The findings demonstrated that BIU is strongly associated with PU and ATU. There is a moderate correlation between PEOU and PU, ATU, BIU and AU. Further, AU is moderately associated with PU, ATU and BIU.

Table 4. Correlation between Constructs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **PEOU** | **PU** | **ATU** | **BIU** | **AU** |
| **PEOU** | Coefficient | **1.000** |  |  |  |  |
| p-value | **0.0** |  |  |  |  |
| N | **142** |  |  |  |  |
| **PU** | Coefficient | .546\*\* | **1.000** |  |  |  |
| p-value | .000 | **0.0** |  |  |  |
| N | 142 | **142** |  |  |  |
| **ATU** | Coefficient | .605\*\* | .751\*\* | **1.000** |  |  |
| p-value | .000 | .000 | **0.0** |  |  |
| N | 142 | 142 | **142** |  |  |
| **BIU** | Coefficient | .535\*\* | .737\*\* | .797\*\* | **1.000** |  |
| p-value | .000 | .000 | .000 | **0.0** |  |
| N | 142 | 142 | 142 | **142** |  |
| **AU** | Coefficient | .423\*\* | .481\*\* | .577\*\* | .529\*\* | **1.000** |
| p-value | .000 | .000 | .000 | .000 | **0.0** |
| N | 142 | 142 | 142 | 142 | **142** |

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

## Hypotheses Testing

Based on path analysis, the proposed model and hypotheses were examined [28, 21, 16, 15]. Table 5 shows that all the 6 hypotheses are supported. The model results are presented in Fig. 3. The majority of the relationships maintain a high level of significance. The strongest path coefficient is presented in the relationship between PU and ATU; however, the weakest path coefficient is presented in the relationship between BIU and AU.

In terms of the variance of constructs, 34.9% of variance in AU is predicted by BIU. 66.2% of variance in BIU is explained by PU and ATU; quite a high percentage. 65.3% of variance in ATU is explained by PU and PEOU. Finally, PEOU explains 37.8% of variance in PU.

Table 5. Path Analysis Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Path** | **β** | **t-value** | **Result** |
| **H1** | PEOU → PU | .618\*\* | 9.31 | Supported |
| **H2** | PEOU → ATU | .633\*\* | 9.67 | Supported |
| **H3** | PU → ATU | .790\*\* | 15.25 | Supported |
| **H4** | PU → BIU | .752\*\* | 13.51 | Supported |
| **H5** | ATU → BIU | .789\*\* | 15.21 | Supported |
| **H6** | BIU → AU | .594\*\* | 8.75 | Supported |

\*\**p*<0.001



Fig. 3. Results Model \*\*p<0.001

# DISCUSSION AND CONCLUSION

The exploitation of new developments in ICT has led to technology designed to enhance education in academic institutions. With the wide adoption of LMS technology in Saudi higher education, this study attempted to understand the acceptance of LMS (Blackboard) within the context of Saudi Arabia from the students’ perspectives. This study, quantitative in nature, used the TAM constructs to investigate the perspectives of Saudi students.

The findings demonstrate students’ acceptance of LMS in Saudi Arabia. This study adds to the evidence of the high reliability of TAM through the use of Cronbach’s alpha measure. The Spearman rank correlation test explains that all the constructs (PEOU, PU, ATU, BIU and AU) are associated with each other. Further, the path analysis technique reveals that all the proposed hypotheses are supported. Students’ AU is influenced by BIU that is affected by students’ ATU and PU. PEOU has an impact on the students’ ATU and PU. As TAM has barely been used in understanding the students’ acceptance of LMS in Saudi Arabia, the findings offer some reassurance that LMS technology, new to Saudi higher education, might play an important part in students’ learning.

The study in hands is not free of limitations. The sample of the experiment includes only 19 female students and 3 PhD students. For this reason, another study might be conducted to expand the sample to include more female and PhD students. Additionally, the participants were students at KAU. The scope of the study can be expanded to include students from different academic institutions or universities in Saudi Arabia. This study took no account of external variables (e.g. psychological, demographic or technical); therefore, future studies may adopt and examine external variables in the context of Saudi Arabia. Finally, this study investigated only the perception of students. At a later time. teachers and administrators can be added to the scope of the study.

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