

# **An Application of the UTAUT Model for Understanding Student Perceptions Using Course Management Software**

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## **ABSTRACT**

Blackboard® is a Web-based tool that is becoming an important and popular course management software application in higher education. Moreover, Blackboard® has been predicted to be the future of all types of distance learning. It provides a number of learning tools, including an online discussion board, course content management, a course calendar, information announcement, electronic mail, reviews, auto-marked quizzes and exams, navigation tools, access control, grade maintenance and distribution, student progress tracking, etc. Blackboard® benefits include a high level of interactivity, a greater level of learner enthusiasm, and a high level of satisfaction. This paper describes student perceptions in terms of applying the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The UTAUT model consolidates previous TAM related studies. However, in this study mixed support for this model was found in terms of the reliability of the scale items representing the UTAUT constructs and the hypothesized relationships. Although students tend to agree that Blackboard® is a good idea and use it frequently, most of software's features are not being used to their fullest capability.

## **INTRODUCTION**

Over the past several years, institutions of higher education have increasingly invested in course management software to provide a virtual learning environment designed to enhance student learning and to assist in the administration of the course itself. In addition, the need for integration of education, practice, and information technology is growing. University and other instructors are often encouraged to find ways to help their students improve their learning skills both inside and outside of the classroom. With the advancement of the Internet and Web technologies, instructors can make online demonstrations of real world applications, as well as facilitate and guide students through the process of analyzing real world cases, gathering information, testing validity and applicability, and creating meaningful solutions for business organizations. Moreover, students can use Web-enabled technologies to access course materials, contact instructors, submit assignments online, and collaborate on team projects. Indeed, the use of the Internet and Web technologies is quickly becoming an educational given, and an important, yet increasing visible part of the students' learning environment.

This paper focuses on student perceptions by applying the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Many universities have or are planning on instituting course management software such as Blackboard® to support development of problem-solving and critical thinking. However, there currently has not been much research to explore the effectiveness of using course management software. To this end, it is important to learn its perceived usefulness from the student perspective. By

better understanding these perceptions, the results of this study may help colleges and universities make better investment decisions and assist instructors in using this technology more effectively. Moreover, it can help course management software designers improve the learning tools to obtain high level satisfaction in the learning environment.

### **BLACKBOARD® – WEB-BASED COURSE MANAGEMENT AND LEARNING TOOL**

Blackboard® is a Web-based tool that is becoming an important and popular course management software application in higher education. It provides a number of learning tools, including an online discussion board, course content management, a course calendar, information announcement, electronic mail, reviews, auto-marked quizzes and exams, navigation tools, access control, grade maintenance and distribution, student progress tracking, etc. (Hutchins, 2001). Students can access the course materials and engage collaborative learning as long as they have an Internet connection. Blackboard® has been predicted to be the future of all types of distance learning (Clark & Lyons, 1999; Lu, Yu, & Liu, 2003). A number of Blackboard® benefits include a high level of interactivity, a greater level of learner enthusiasm, and a high level of satisfaction (Westbrook, 1999).

More importantly, Blackboard® is designed to support collaborative learning, knowledge building, and multiple representations of ideas and knowledge structure. The literature indicates that cooperation, coordination, and collective approaches are all desirable characteristics. Learners in a cooperative environment have been found to outperform other work groups. Moreover, a positive relationship between cooperative learning and learning effectiveness has also been found, while student learning and satisfaction can be significantly enhanced when collaborative assessment approach is taken (Janz, 1999; Landry, Griffeth, & Hartman, 2006).

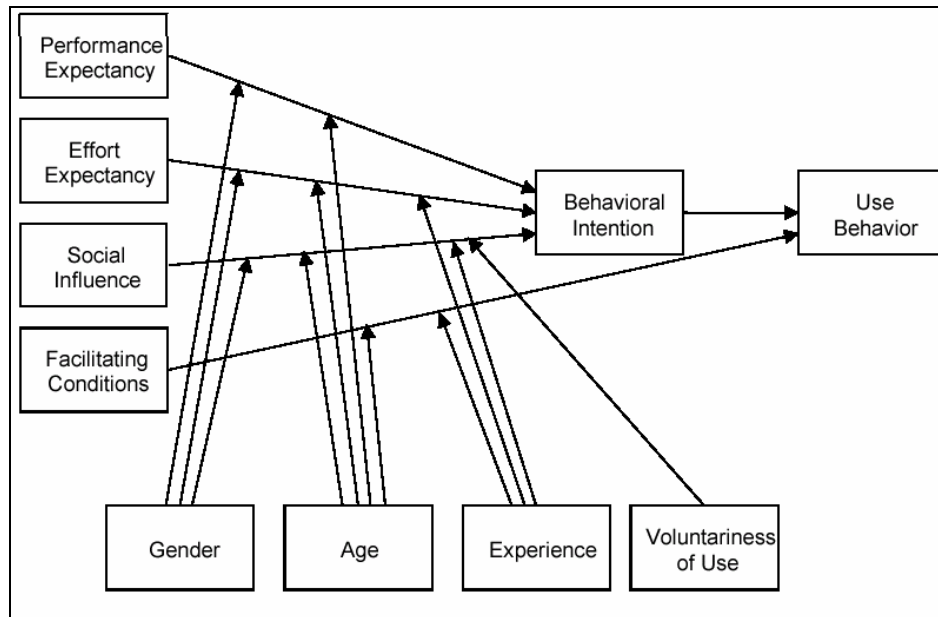
### **THE UTAUT MODEL**

A number of theoretical models have been proposed to facilitate the understanding of factors impacting the acceptance of information technologies (e.g., Davis, 1989; Chau, 1996; Venkatesh & Davis, 2000). Among these studies, the Technology Acceptance Model (TAM) is one of the most influential and robust in explaining IT/IS adoption behavior. The key purpose of TAM was to provide a basis for discovering the impact of external variables on internal beliefs, attitudes, and intentions.

TAM assumes that beliefs about usefulness and ease of use are always the primary determinants of information technologies adoption in organizations. According to TAM, these two determinants serve as the basis for attitudes toward using a particular system, which in turn determines the intention to use, and then generates the actual usage behavior. Perceived usefulness is defined as the extent to which a person believes that using a system would enhance his or her job performance. Perceived ease of use refers to the extent to which a person believes that using a system would be free of mental efforts (Davis, 1989). However, the original TAM model was created to examine IT/IS adoption in business organizations. The model's suitability for predicting general individual acceptance, especially in higher education, needs to be explored.

Venkatesh, Morris, Davis, and Davis (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to consolidate previous TAM related studies (see Figure 1). In the UTAUT model, performance expectancy and effort expectancy were used to incorporate the constructs of perceived usefulness and ease of use in the original TAM study. Although the UTAUT model posits that the Effort Expectancy construct can be significant in determining user acceptance of information technology, concerns for ease of use may become non-significant over extended and sustained usage. Therefore, perceived ease of use can be expected to be more salient only in the early stages of using a new technology and it can have a positive effect on perceived usefulness of the technology.

Figure 1: UTAUT Model.



Moreover, the UTAUT model attempts to explain how individual differences influence technology use. More specifically, the relationship between perceived usefulness, ease of use, and intention to use can be moderated by age, gender, and experience. For example, the strength between perceived usefulness and intention to use varies with age and gender such that it is more significant for male and younger workers. The effect of perceived ease of use on intention is also moderated by gender and age such that it is more significant for female and older workers, and those effects decrease with experiences. The UTAUT model accounted for 70 percent of the variance in usage intention, better than any of TAM studies alone. Although UTAUT provides great promise to enhance our understanding for technology acceptance, the initial UTUAT study focused on large organizations. In addition, the scales used in UTAUT model are new as they are in combination of a number of prior scales, and therefore, the suitability of these scales needs to be further tested.

## METHODOLOGY

An online survey was developed based on the instrument developed by Venkatesh, et. al. (2003). Data was collected from October 2006 through April 2007. The research subjects were undergraduate (50%) and graduate (50%) business school students at a large Midwestern university in the United States where the use of Blackboard® is strongly encouraged. One hundred thirty two students from the university's college of business participated in the survey. In addition, 68.1% were male and 31.1% were female. Table 1 provides a summary of the participants' ages and Table 2 summarizes their reported major. The survey form was designed using ASP.Net in the Visual Studio 2005 platform. The respondents filled in the answers by clicking appropriate boxes and submitted their responses to a Web server, which was used to administrate the survey. All respondents' inputs were recorded into a Microsoft SQL Server database table.

**Table 1: Participant Ages (n=132).**

Age Group	Frequency	Percent
17-18	5	3.8%
19-20	41	31.1%
21-22	34	25.8%
23-25	13	9.8%
26-28	10	7.6%
29-31	29	22.0%
32+	0	0.0%

**Table 2: Reported Majors (n=132).**

Major	Frequency	Percent
Operations Management & Information Systems	71	53.8%
Management	1	0.8%
Marketing	1	0.8%
Accounting	3	2.3%
Finance	13	9.8%
Undecided	43	32.6%

In addition, a reliability analysis was conducted for the scales using Cronbach's Alpha. As summarized in Table 3, several of the scales that represent the UTAUT constructs appear to have a good degree of reliability since each computed statistic is above .70. Unfortunately, it appears that the Facilitating Conditions, Self-Efficacy, and Anxiety are questionable because their respective test statistic falls well below .70.

**Table 3: Reliability Analysis (n=132).**

UTAUT Construct	Cronbach's Alpha	Number of Items
<i>Performance Expectancy</i>	.836	4
<i>Effort Expectancy</i>	.892	4
<i>Attitude Toward Using Technology</i>	.830	5
<i>Social Influence</i>	.770	5
<i>Facilitating Conditions</i>	.452	4
<i>Self-Efficacy</i>	.250	3
<i>Anxiety</i>	.579	4
<i>Behavioral Intention</i>	.990	3

## RESULTS

### CORRELATION ANALYSIS

Table 4 provides a summary of a Spearman correlation analysis to test the relationships among the UTAUT constructs. While the UTAUT model suggests a positive relationship between Performance Expectancy and Behavioral Intention, it appears that the data do not support a significant relationship between these

two concepts. However, significant relationship can be found between Effort Expectancy and Behavioral Intention, as well as between Social Influence and Behavioral Intention at the .05 level of significance. Unfortunately, no significant relationships can be found between age and gender with respect to their hypothesized relationships with Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions.

**Table 4: Spearman’s Correlations for n=132.**

	Age	Gender	PE: Performance Expectancy	EE: Effort Expectancy	A: Attitude Toward BB	SI: Social Influence	FC: Facilitating Conditions	SE: Self Efficacy	ANX: Anxiety	BI: Behavioral Intentions
<b>Age</b>	1.00									
<b>Gender</b>	.158 .071	1.00								
<b>PE: Performance Expectancy</b>	.007 .938	-.086 .329	1.00							
<b>EE: Effort Expectancy</b>	-.159 .069	-.003 .974	.428** .000	1.00						
<b>A: Attitude Toward BB</b>	.095 .279	-.058 .512	.616** .000	.490** .000	1.00					
<b>SI: Social Influence</b>	-1.64 0.060	-.146 .096	.577** .000	.463** .000	.501** .000	1.00				
<b>FC: Facilitating Conditions</b>	-.080 .361	-.040 .652	.457** .000	.630** .000	.470** .000	.478** .000	1.00			
<b>SE: Self Efficacy</b>	.138 .114	-.139 .111	.422** .000	.377** .000	.410** .000	.399** .000	.415** .000	1.00		
<b>ANX: Anxiety</b>	-.179* .039	-.078 .373	-.170 .052	-.364** .000	-.328** .000	-.113 .195	-.465** .000	-.153 .080	1.00	
<b>BI: Behavioral Intentions</b>	- 334** .000	-.039. 653	.087 .322	.198* .023	.010 .906	.200* .021	.087 .320	-.146 .094	.050 .572	1.00

\*\* 2-tailed Significance at .001; \* 2 tailed significance at .05.

**DESCRIPTIVE ANALYSIS**

A descriptive statistical analysis is described in this section in order to provide a richer understanding of the students’ perceptions. Table 5 summarizes the frequencies and corresponding percentages for the students’ perceptions with respect to Performance Expectancy. As can be seen the students tend to believe that Blackboard® is a useful and productive tool; however, they tend to be a bit more neutral in terms of their perception that Blackboard will increase their chances of getting a better grade.

**Table 5: Descriptive Statistics for Performance Expectancy (n = 132).**

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
PE1: I find Blackboard® useful in my studies.	6 (4.5%)	3 (2.3%)	3 (2.3%)	15 (11.4%)	29 (22.0%)	<b>51 (38.6%)</b>	25 (18.9%)	5.36	1.473
PE2: Using Blackboard® enables me to accomplish tasks more quickly.	3 (2.3%)	2 (1.5%)	8 (6.1%)	26 (19.7%)	36 (27.3%)	<b>38 (28.8%)</b>	19 (14.4%)	5.12	1.342
PE3: Using Blackboard® increases my productivity	2 (1.5%)	2 (1.5%)	6 (4.5%)	14 (10.6%)	31 (23.5%)	<b>48 (36.4%)</b>	29 (22.0%)	5.50	1.293
PE4: If I use Blackboard®, I will increase my chances of getting a better grade.	9 (6.8%)	12 (9.1%)	11 (8.3%)	<b>30 (22.7%)</b>	27 (20.5%)	27 (20.5%)	16 (12.1%)	4.51	1.714

Table 6 provides a descriptive analysis of the students’ perceptions regarding Effort Expectancy. It appears that the students tend to agree that Blackboard® is understandable, easy to become skillful, and easy to learn. Moreover, they tend to strongly agree that Blackboard® is easy to use. The descriptive statistics in Table 7 also suggest that the students surveyed tend to believe that Blackboard® is a good idea and that they like to use it; however, they appear to be somewhat neutral in terms of perceiving that Blackboard® will help them get better grades.

**Table 6: Descriptive Statistics for Effort Expectancy (n = 132).**

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
EE1: My interaction with Blackboard® is clear and understandable.	1 (0.8%)	3 (2.3%)	1 (0.8%)	15 (11.4%)	22 (16.7%)	<b>49 (37.1%)</b>	41 (31.1%)	5.77	1.229
EE2: It is easy for me to become skillful at using Blackboard®.	1 (0.8%)	2 (1.5%)	2 (1.5%)	11 (8.3%)	15 (11.4%)	<b>54 (40.9%)</b>	47 (35.6%)	5.93	1.173
EE3: I find Blackboard® easy to use.	2 (1.5%)	1 (0.8%)	1 (0.8%)	2 (1.5%)	27 (20.5%)	49 (37.1%)	<b>50 (37.9%)</b>	6.02	1.105
EE4: Learning to operate Blackboard® is easy for me.	1 (0.8%)	2 (1.5%)	3 (2.3%)	3 (2.3%)	22 (16.7%)	<b>53 (40.2%)</b>	48 (36.4%)	5.98	1.126

Table 7: Descriptive Statistics for Attitude toward Using Blackboard® (n = 132).

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
A1: Using Blackboard® is a good idea.	3 (2.3%)	0 (0.0%)	4 (3.0%)	4 (3.0%)	20 (15.2%)	<b>53 (40.2%)</b>	48 (36.4%)	5.95	1.129
A2: Using Blackboard® is a bad idea.	<b>67 (50.8%)</b>	39 (29.5%)	12 (9.1%)	5 (3.8%)	3 (2.3%)	4 (3.0%)	2 (1.5%)	1.92	1.351
A3: Blackboard® makes classes more interesting.	10 (7.6%)	14 (10.6%)	12 (9.1%)	<b>59 (44.7%)</b>	14 (10.6%)	16 (12.1%)	7 (5.3%)	3.98	1.511
A4: Working with Blackboard® is fun.	9 (6.8%)	14 (10.6%)	15 (11.4%)	<b>54 (40.9%)</b>	22 (16.7%)	14 (10.6%)	4 (3.0%)	3.94	1.424
A5: I like working with Blackboard®	3 (2.3%)	2 (1.5%)	9 (6.8%)	19 (14.4%)	28 (21.2%)	<b>50 (37.9%)</b>	21 (15.9%)	5.28	1.367

Interestingly, the descriptive analysis in Table 8 suggests that the students may not be influenced by others who think they should use Blackboard®, but they tend to agree that the university's administration and professors support the use of Blackboard®. Moreover, adequate support from the administration is available to the students.

Table 8: Descriptive Statistics for Social Influence (n = 132).

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
SI1: People who influence my behavior think that I should use Blackboard®	5 (3.8%)	11 (8.3%)	8 (6.1%)	<b>68 (51.5%)</b>	22 (16.7%)	13 (9.8%)	5 (3.8%)	4.14	1.277
SI2: People who are important to me think that I should use Blackboard®	6 (4.5%)	6 (4.5%)	6 (4.5%)	<b>78 (59.1)</b>	18 (13.6%)	13 (9.8%)	5 (3.8%)	4.17	1.220
SI3: The administration of this university has been supportive in the use of Blackboard®	0 (0.0%)	3 (2.3%)	8 (6.1%)	22 (16.7%)	30 (22.7%)	<b>47 (35.6%)</b>	22 (16.7%)	5.33	1.240
SI4: In general, the university	1 (0.8%)	2 (1.5%)	9 (6.8%)	9 (6.8%)	21 (15.9%)	<b>54 (40.9%)</b>	36 (27.3%)	5.67	1.287

has supported the use of Blackboard®									
SI5: My professors have been supportive in the use of Blackboard®	2 (1.5%)	6 (4.5%)	10 (7.6%)	12 (9.1%)	31 (23.5%)	<b>47</b> <b>(35.6%)</b>	24 (18.2%)	5.28	1.437

Similarly, the descriptive statistics in Table 9 also support the students' perceptions that they have the necessary resources, knowledge, and support to use Blackboard®.

**Table 9: Descriptive Statistics for Facilitating Conditions (n = 132).**

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
FC1: I have the resources necessary to use Blackboard®	0 (0.0%)	0 (0.0%)	1 (0.8%)	6 (4.5%)	24 (18.2%)	47 (35.6%)	<b>54</b> <b>(40.9%)</b>	6.11	0.913
FC2: I have the knowledge necessary to use Blackboard®	0 (0.0%)	2 (1.5%)	0 (0.0%)	4 (3.0%)	15 (11.4%)	38 (28.8%)	<b>73</b> <b>(55.3%)</b>	6.32	0.968
FC3: Blackboard® is not compatible with other applications I use (such as MS Word, MS Excel, etc.)	25 (18.9%)	<b>31</b> <b>(23.5%)</b>	11 (8.3%)	46 (34.8%)	7 (5.3%)	8 (6.1%)	4 (3.0%)	3.14	1.607
FC4: A specific person (or group) is available for assistance with difficulties I experience with Blackboard®	11 (8.3%)	10 (7.6%)	22 (16.7%)	<b>46</b> <b>(34.8%)</b>	23 (17.4%)	16 (12.1%)	4 (3.0%)	3.94	1.471

Table 10 provides the descriptive analysis for Self-Efficacy. Again, the students tend to agree that Blackboard® is easy to use, but seem to be more neutral with respect to just being able use the built-in help facility.

**Table 10: Descriptive Statistics for Self-Efficacy (n = 132).**

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
SE1: I could complete most tasks using Blackboard® if there was no one	1 (0.8%)	4 (3.0%)	5 (3.8%)	11 (8.3%)	20 (15.2%)	<b>51</b> <b>(38.6%)</b>	40 (30.3%)	5.71	1.317

around to tell me what to do as I go.									
SE2: I could complete most tasks using Blackboard® if I could call someone for help if I got stuck.	4 (3.0%)	15 (11.4%)	7 (5.3%)	<b>37</b> <b>(28.0%)</b>	33 (25.0%)	18 (13.6%)	18 (13.6%)	4.56	1.584
SE3: I could complete most tasks using Blackboard® with just the built-in help facility for assistance.	3 (2.3%)	15 (11.4%)	12 (9.1%)	<b>38</b> <b>(28.8%)</b>	23 (17.4%)	27 (20.5%)	14 (10.6%)	4.52	1.565

Not surprisingly, given today’s students exposure to technology, the students do not have a high level on anxiety when using Blackboard®. Moreover, Table 11 suggests a high level of use in terms of Behavioral Intention.

**Table 11: Descriptive Statistics for Anxiety (n = 132).**

Questionnaire Item	1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neither Agree Or Disagree	5 Slightly Agree	6 Agree	7 Strongly Agree	Mean	Std. Dev.
ANX1: I feel apprehensive about using Blackboard®	<b>47</b> <b>(35.6%)</b>	34 (25.8%)	14 (10.6%)	14 (10.6%)	9 (6.8%)	8 (6.1%)	6 (4.5%)	2.64	1.796
ANX2: It scares me to think that I could lose a lot of information using Blackboard® by clicking the wrong button.	30 (22.7%)	<b>35</b> <b>(26.5%)</b>	19 (14.4%)	12 (9.1%)	8 (6.1%)	15 (11.4%)	13 (9.8%)	3.23	2.021
ANX3: I hesitate to use the system for fear of making mistakes I cannot correct.	<b>63</b> <b>(47.7%)</b>	37 (28.0%)	18 (13.6%)	9 (6.8%)	1 (0.8%)	4 (3.0%)	0 (0.0%)	1.94	1.203
ANX4: Blackboard® is somewhat intimidating to me.	<b>59</b> <b>(44.7%)</b>	35 (26.5%)	14 (10.6%)	11 (8.3%)	7 (5.3%)	3 (2.3%)	3 (2.3%)	2.19	1.509

**Table 12: Descriptive Statistics for Behavioral Intention (n = 132).**

Questionnaire Item	1 (Not This Semester)	2 (15-30 Days)	3 (8-14 Days)	4 (4-7 Days)	5 (0-3 Days)	Mean	Std. Dev.
BI1: I intend to use	18	9	1	6	<b>98</b>	4.19	1.494

Blackboard® in the next <n> days.	(13.6%)	(6.8%)	(0.8%)	(4.5%)	<b>(74.2%)</b>		
BI2: I predict I will use Blackboard® in the next <n> days.	17 (12.9%)	8 (6.1%)	1 (0.8%)	6 (4.5%)	<b>100 (75.8%)</b>	4.24	1.457
BI3: I plan to use Blackboard® in the next <n> days.	17 (12.9%)	7 (5.3%)	2 (1.5%)	6 (4.5%)	<b>100 (75.8%)</b>	4.25	1.448

In addition to studying the UTAUT model more closely, this study also looked at the features or functionality of Blackboard® that students tend to use. As can be seen in Table 13, students use Blackboard® mostly for obtaining course information, announcements, and checking their grades. To a lesser extent, they sometimes use the digital drop box for submitting assignments, etc. and the office hours feature.

**Table 14: Descriptive Statistics for Features of Blackboard® (n = 132).**

Questionnaire Item	1 Never Use	2 Seldom Use	3 Sometimes Use	4 Often Use	Mean	Std. Dev.
FB1: Course Information	2 (1.5%)	11 (8.3%)	35 (26.5%)	<b>84 (63.6%)</b>	3.52	0.715
FB2: Announcements	1 (0.8%)	14 (10.6%)	31 (23.5%)	<b>86 (65.2%)</b>	3.53	0.715
FB3: Calendar	<b>69 (52.3%)</b>	34 (25.8%)	19 (14.4%)	10 (7.6%)	1.77	0.962
FB4: Tasks	<b>54 (40.9%)</b>	30 (22.7%)	30 (22.7%)	18 (13.6%)	2.09	1.087
FB5: E-Mail	<b>63 (47.7%)</b>	34 (25.8%)	27 (20.5%)	8 (6.1%)	1.85	0.953
FB6: Discussion Board	<b>61 (46.2%)</b>	43 (32.6%)	27 (20.5%)	1 (0.8%)	1.76	0.802
FB7: Virtual Classroom	<b>103 (78.0%)</b>	18 (13.6%)	11 (8.3%)	0 (0.0%)	1.30	0.617
FB8: Office Hours	40 (30.3%)	31 (23.5%)	<b>47 (35.6%)</b>	14 (10.6%)	2.27	1.010
FB9: Chatroom	<b>114 (86.4%)</b>	14 (10.6%)	3 (2.3%)	1 (0.8%)	1.17	0.486
FB10: Glossary Manager	<b>107 (81.1%)</b>	14 (10.6%)	10 (7.6%)	1 (0.8%)	1.28	0.634
FB11: Online Testing	<b>56 (42.4%)</b>	24 (18.2%)	25 (18.9%)	27 (20.5%)	2.17	1.188
FB12: Online Survey	<b>70 (53.0%)</b>	34 (25.8%)	21 (15.9%)	7 (5.3%)	1.73	0.915
FB13: Gradebook	5 (3.8%)	10 (7.6%)	26 (19.7%)	<b>91 (68.9%)</b>	3.54	0.795
FB14: Messages	<b>43 (32.6%)</b>	29 (22.0%)	39 (29.5%)	21 (15.9%)	2.29	1.088
FB15: Online Help	<b>84 (63.6%)</b>	29 (22.0%)	18 (13.6%)	1 (0.8%)	1.52	0.756
FB16: Digital Drop Box	30 (22.7%)	23 (17.4%)	<b>49 (37.1%)</b>	30 (22.7%)	2.60	1.076

## CONCLUSIONS

This study describes student perceptions of using Blackboard® by applying the UTAUT model. The results of the study did not find strong support for the UTAUT model. Although the UTUAT study by Venkatesh, et. al. (2003) suggests that the age effects greater for older workers and a stronger willingness for the younger workers to adopt new IT products, it appears that in this study age does not have a significant effect on Blackboard® use. This may be because that the research subjects in the study are relatively young (i.e., all less than 32 years old). In addition, most students in the study are most likely familiar with the use technology in their everyday lives. Therefore, age, in this case, may not be an important factor or association with the perceived usefulness of Blackboard®.

Similar to age, gender has been recognized to play an important moderating role in IT/IS acceptance research. The male gender's relative tendency to feel more at ease with computers has also been demonstrated in the IS literature and UTUAT studies. In our study, gender did not appear to have a significant effect on Blackboard® use. Without referring to age, studying gender alone will be misleading since women born in different decades are likely to have had very different educational and occupational opportunities. As a result, the observed pattern of gender differences could be expected to differ based on age (Venkatesh, Morris, Davis, & Davis, 2003). In our sample, both men and women are college students and enjoy the same level of quality education and access to technology. Therefore, it may not be surprising to see that both age and gender did not demonstrate a moderating effect on the Blackboard® use given students' widespread use of technology.

Due to the limited sample size of this study, further research is needed to include older students (e.g., distance learning) for testing the fitness of the UTUAT model. However, this study raises some important questions. Does the UTAUT model fit well with large organizations? Or it can be extended to the adoption of Blackboard®? Do the scales and measurement constructs in the UTUAT model need to be revised? Another future direction for research is the use of Blackboard® itself. Schools are investing heavily in course management software. Is it really that much better than a web site? Or is the software just not being used it to its full capabilities? If this is the case, then a better model for understanding adoption may be needed. Nonetheless, this study can provide helpful direction for the further explore the UTAUT model in the technology acceptance research.

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