**An Evaluation of First-time Blackboard Learn Users’ Satisfaction**

**Abstract**: This study evaluated first-time users’ satisfaction of using a version of Blackboard Learn user interface that had been adopted as an online/blended teaching-learning management tool in fall 2012 at the University of Alabama, in the United States. Users’ satisfaction was measured in terms of the overall consistency, easiness of use, universability, positive aspects, and problems/limitations of the Blackboard Learn user interface. Data were collected through a number of 5-point Likert scale type items through an online survey developed and conducted by the researcher. The survey also gathered participants’ gender and major area of study to determine if there exists any significant difference in their satisfaction, among the possible groups in these measures. Results revealed that first-time Blackboard Learn users are most likely overall satisfied in using it without any significant difference among male vs. female; and engineering vs. non-engineering major users. Blackboard users are satisfied with a number of its advanced features, although they have reported some noticeable problems, limitations, and recommendations.

**Keywords**: Blackboard Learn, Shneiderman’s golden rules of user interface design, user interface evaluation

**Introduction:**

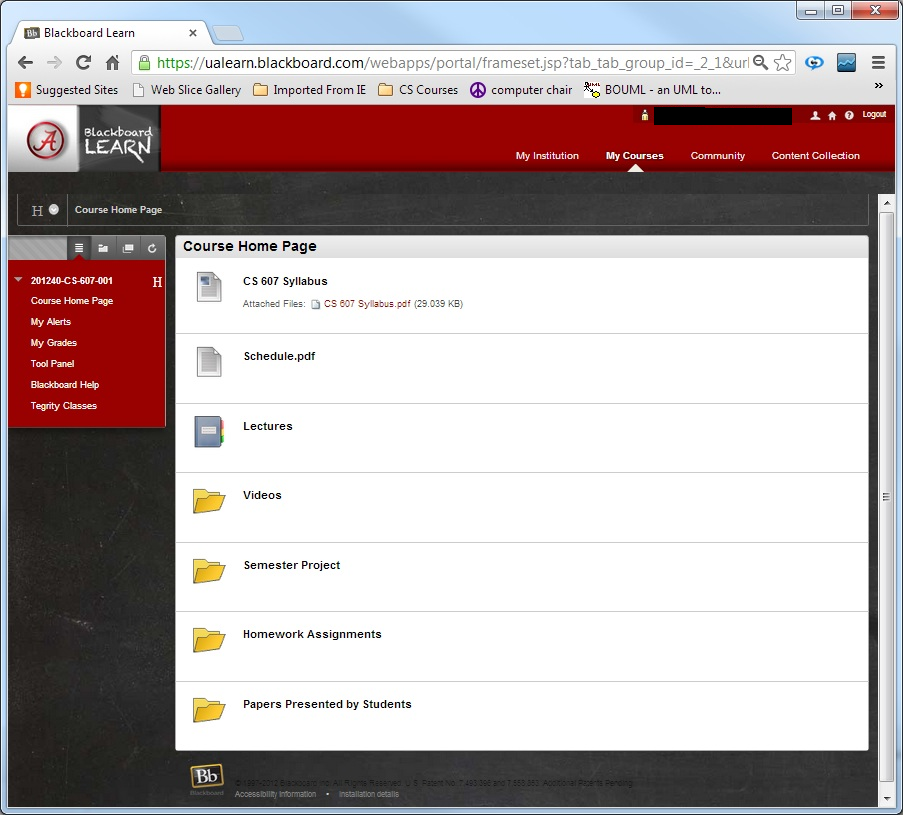
Blackboard Learn is a powerful teaching-learning management system (Anderson, 2009), provided by the Blackboard Inc., an enterprise software company, and primarily dedicated to developing education software, in particular learning management systems. In 1997, Blackboard Inc. was founded as an enterprise software company with its corporate headquarters in Washington, D.C., is primarily known as a developer of education software, in particular learning management systems. Blackboard Inc. was founded in 1997, as a small education technology company; and in 1998 it launched its first course management software (Business Wire, 1998; Washington Business Journal, 2004). After merging with several companies, it became a public company, in June 2004 (Bradford, Porciello, Balkon, & Backus, 2007). In the recent years Blackboard Inc. has acquired some other similar online learning providers such as WebCT, ANGEL Learning and jointly control about 80 percent of the academic course management system market in North America (Bradford et al., 2007). Blackboard Inc. alone is used by more than 70 percent of the U.S. colleges and universities. As of December 2010, Blackboard software and services are used by over 9,300 institutions in more than 60 countries (Blackboard.com; Bradford et al., 2007).

There are several e-learning products of Blackboard Inc. system, such as Blackboard Learn, Blackboard Collaborate, Blackboard Connect, Blackboard Transact, Blackboard Analytics, Blackboard Mobile, and Blackboard Engage. Blackboard Learn provides easy-to-use educational instruction, communication, and assessment in online and blended learning course delivery system. These products are offered in 12 languages to over 2,200 learning institutions and contain more than 2,500 supplements from educational publishers (Bradford et al., 2007).

The Blackboard Learn comprises four modules: (1) a learning system that provides online course delivery and management for institutions; (2) a community and portal system for use in creating online campus communities; (3) a content management system for centralized control over course content; and (4) a system to record and analyze student assessment results (Blackboard.com; Herlin, 2010). Students and faculty get several benefits from Blackboard Learn course management systems. Some of the potential benefits include: (1) increased availability, (2) quick feedback, (3) improved communication, (4) tracking, and (5) skill building (Bradford et al., 2007).

In April 2010, the latest version 9.1 of Blackboard Learn has been released; and yet to be launched as an upgrade of eLearning, the previously used version of Blackboard. In fall 2012, the new Blackboard Learn has been started using by some instructors and students at the University of Alabama, and is expected to be started by all instructors and students at the university from spring 2013. The new Blackboard Learn has some additional features from ANGEL Learning and WebCT platforms as well as, the Web 2.0 technologies and social learning tools. The Blackboard Learn is supposed to allow instructional developers and instructors extending the functionality of the system; creating customized course management; and delivery by developing software and applications known as Building Blocks (Etesse, 2004). Building Blocks allow third-party developers to create customizations and extensions for Blackboard Learn through open Application Programming Interface and web services (Batson, 2011).

This study was conducted to evaluate first-time users’: students, graders, course developers, and instructors’ experience on using new interface of the Blackboard Learn at the University of Alabama. The rest of the paper presents significance and theoretical framework of the study; research questions; the survey and d**ata** collection procedures; validity and reliability of the study; working definitions for the independent and dependent variables; participants and data; an overview of the satisfaction scores; results specific to the research questions; findings, discussion, and implication, followed by the limitation of the study; and ends with conclusions.



Picture 1. A Screenshot of Blackboard Learn 9.1 User Interface Course Home Page

**Significance of the Study**

### The Blackboard Learn management itself affirms that the new version of the interface in Blackboard Learn 9.1, is quite different from its predecessor eLearning and even its previous version, Blackboard Learn 7.3 (Blackboard Knows Issues, 2012). The Blackboard management confesses that the users of its new version have had some issues such as: Database Deadlock Conditions Causing Multiple Outages; e-Authentication Requests While Opening Office Documents; Security Prompts Accessing Content Outside of Blackboard; Intermittent Delays or Errors; **Error in Reading Grade;** Intermittent Java Errors and Database Instability; Users Enrolled as Guests Cannot View Guest; Error Message when Submitting Group Assignments; Students Unable to Open Documents in Some Courses; Announcements do not Reorganize Correctly; Course Roster Appears Blank; Hidden Columns Still Visible to Students; etc. (Blackboard Knows Issues, 2012).

Thus, it is most likely that with the new interface some of the Blackboard users such as students, instructors, graders, and course developers are facing some of the above mentioned and/or other problems that need to be examined and brought to the attention to me. Moreover, it was expected that the users are having some kind of new or different experience in using the new Blackboard Learn interface. Thus, it came to my attention and interest to evaluate users’ satisfaction with the Blackboard Learn new interface.

It was the intent of the researchers to record participants’ gender; and to compare male and female participants’ satisfaction in using the Blackboard Learn. This comparison has had an intrinsic importance in the sense that studies have found that men and women users consider and work on the Internet very differently (Fallows, 2005; Grove, 2010). For instance, more **men than women perform online financial transactions; men pursue and consume information online more aggressively than women; on the other hand,** women appear to have overtaken men in online shopping; women send and receive emails in a richer and more engaging way (Fallows, 2005). Thus, it could be that men and women might have different satisfaction level in using the Blackboard Learn as an online course management tool.

The researcher also sought to determine if there is a significant difference between engineering and non-non engineering major users’ satisfaction in using the Blackboard learn. The importance of this comparison was that the researchers were major in the College of Engineering and have had a though that the college of Engineering students might have different satisfaction level in using Blackboard Learn than students of other colleges. Moreover, the researchers had easy access to some instructors of the College of Engineering for getting pre-permission for sending the survey request through them. Thus, the researchers generally expected to have more participants from the college of Engineering than other colleges. This assumption was found appropriate as at the time of closing the survey there were about xx% of participants reported their college of major study area as Engineering.

**Theoretical Framework**

This empirical study is based on the *Golden Rules of Interface Design,* proposed by Shneiderman (1998). Shneiderman (1998)’s eight rules for user interface design have been considered as the Golden Rules of User Interface Design. Although these rules are years older, they still guide the interface designers maintaining basic design pattern and user expectation for user interface design. A brief summarization of each of the eight rules is presented here, extracted from Shneiderman (1998). (1) *Strive for Consistency* states that user interface of any new or modified system should be consistent with the existing, if any, common, and popular applications. Consistency should be in terminology, language, and steps of basic tasks and aspects. A consistent interface enables users to have a better understanding of how things will work; and increases their efficiency in using the application. (2) *Provide Universal Usability* aims to produce systems that will be usable to everyone, regardless of their cognitive and physical skills. It urges interface designers to recognize diverse users’ needs; and facilitate flexibility of transformation of content and features. (3) *Offer Informative Feedback* emphasizes that for every user action the system should ensure the user that the action has been executed. This could be done through some meaningful feedback, such as if color or shape of a selected item is changed the user will be confirmed that the item is really selected. (4) *Design Dialogs to yield Closure* recommends organizing sequences of actions into groups with a beginning, middle, and end of each task. For instance, for a successfully completed action, providing a clear message can inform the user that the previous action is executed and about the next step(s) to do to complete the task. Providing direct manipulation helps users seeing immediate and visible outputs of their actions. (5) *Prevent Errors* recommends that a user interface should allow for and tolerate users’ mistakes as well as system errors. No matter how clear and easy a system and its interfaces are designed, it is considered that users will make mistakes. So, the user interface should keep undo, redo, and data recovery options; and should show short messages clearly stating the mistake and specific instructions for recovery. (6) *Permit Easy Reversal of Actions* recommends that a user interface should be as much reversible as possible such as if a user does any mistake or due to system fail or computer restart the user finds his actions back as far he had completed correctly. (7) *Support internal locus of control* recommends that the interface should be under control of novice as well as expert users, no matter their actions are right or wrong. An ideal interface should not enforce existing users to change the ways they are used to performing common actions, entering data or finding desire outputs. Finally, (8) *Reduce Short-term Memory Load* rule recommends that the individual tasks of an action should be designed as independent to each other so the users do not need to remember any information provided in the previous task(s).

**Research Questions**

This study evaluated first-time users’ satisfaction in using a new user interface of Blackboard Learn that is used as an online/blended teaching-learning management tool. Users’ satisfaction was measured in terms of the overall consistency, easiness of use, universability, positive aspects, and problems/limitations of the Blackboard Learn user interface; and was compared by participants’ gender and major area of study to determine if there exit any significant difference in their satisfaction among the possible groups in these measures. Thus, the study was conducted to answer the following three research questions:

1. Is there significant difference between male and female users’ satisfaction in using the Blackboard Learn user interface?
2. Is there significant difference between engineering and non-engineering major users’ satisfaction in using the Blackboard Learn user interface?
3. What are the major positive aspects and problems/limitations of the Blackboard Learn user interface?

Data for the first two research questions were collected quantitatively through a number demographic and sixteen 5-point Likert-type scale items; and data for the last research question were collected qualitatively through two separate open ended questions using an online survey, developed and conducted by the researcher (Appendix C).

**The Survey and Data Collection Procedures**

In order to collect data for the above research questions, the researcher sought permission from the University of Alabama Institutional Review Board (IRB) to conduct a survey in the campus. After having permission from the UA IRB, the survey instrument was uploaded on Google Drive. The survey instrument is available at: <https://docs.google.com/spreadsheet/viewform?formkey=dERNY3lqd084TXlkRjFOcDNoQVc1eXc6MA>

The survey included four major sections:

1. Consent Statement (the beginning page);
2. Participants’ demographic information (item numbers: 1- 6);
3. Participants’ satisfaction with the Blackboard Learn user interface (item numbers: 7-22); and
4. Open-ended questions regarding the positive aspects, and problems or limitations of Blackboard Learn user interface (item numbers: 23-25).

The first section was designed to collect participants’ consent in participating in the survey. This section included the basic information about the study required to be information to the participants before starting the survey. Participants, who did agree to participate in the study, by clicking on the “Yes” button were allowed to proceed to the main body of the survey. The second section was designed to collect participants’ demographic information in terms of their college of major area of study, level of study at the university, level of familiarity in suing Blackboard Learn and its predecessor eLearning, and major role in using Blackboard Learn.

The third section was intended to measure participants’ overall satisfaction in using the Blackboard Learn user interface through 16 Likert-type items (item numbers 7-22) with a 5-point scale: *Totally Dissatisfied, Dissatisfied, Neutral, Satisfied,* and *Totally Satisfied*. The first three items of this section (item numbers 7-9) were about the simplicity of the Blackboard Learn user interface. The next eight items (item numbers 10 -17) were intended to measure participants’ satisfaction in terms of the golden rules of user interface design. Then the last five Likert-type items (item numbers 18 to 22) were intended to measure participants’ satisfaction in terms of its common and advanced features of the Blackboard Learn user interface. Finally, the fourth section was designed with three open ended questions, was intended to collect participants’ written comments regarding the positive aspects, and problems or limitations of Blackboard Learn user interface.

In order to recruit participants, a solicitation email was sent to a number of instructors of the various departments of the university, stating the objectives and necessity of the study; and the URL of the survey. In the email, a draft of another email solicitation for the prospective participants was sent to the instructors, as an attachment, and the instructors were requested to send emails to their prospective students inviting to participate in the study. The attached email contained the URL of the online survey and a brief statement of purpose and procedure to participate in the study. A similar email attachment was sent the University Student News Service authority with a request to post a message and link of the survey to the general student population through the UA Student News Service.

**Validity and Reliability Measures**

Validity is the most important characteristic a measuring instrument can possess (Reilly, 2007). According to Gay and Airasian (2003), “Validity is concerned with the appropriateness of the interpretations made from the test scores” (p. 133). To be effective, studies look at both internal and external validity. Internal validity is checked using face validity (Reilly, 2007). According to Sirkin (1999), “face validity is the extent to which the measure is subjectively viewed by knowledgeable individuals as covering the concept” (p. 74).

Validity of this instrument was measured through the face validity process. To do this, the instrument was first given to three computer science graduate students who were knowledgeable about user interface design, by taking a graduate level class on Software User Interface Design in computer science at the University of Alabama along with the first researcher of this study. Those graduate students suggested some correction in wording some question to make them easy to understand of the participants. Finally, the instructor of this class, who has long time expertise in teaching software engineering, human computer interaction, and software user interface design; and conducting empirical research in these areas, carefully edited each and every item of the survey. Thus, the survey instrument seems to be valid to meet purposes of this study.

Reliability measures the degree of consistency between two measures of the same construct (Mehrens & Lehman, 1987). According to Gay and Airasian (2003), “Reliability is the degree to which a test consistently measures whatever it is measuring” (p. 141). In other words, reliability measures whether the same result is obtained if the study is replicated in a similar situation (Reilly, 2007). For instance, if a person's weight is measured on a standard scale, the scale should register the same measure every time the person’s weight is measured. Split-half is the easiest method and eliminates the need for multiple administrations of a test and eliminates the need to develop another form of the instrument (Siegle, 2002). According to Siegle (2002), Likert-type scale items Cronbach's alpha (α) is another alternative measure of the internal consistency of a test, that can be easily calculated using SPSS for Windows. Cronbach's alpha is interpreted as the percent of variance an observed scale would explain in the hypothetical true scale composed of all possible items in the universe. It is considered that when α *=* 0, the true score is not measured at all, and there is only an error component; when αequals 1, all items measure only the true score and there is no error component. Thus, the closer α isto 1, the greater the internal consistency of the test is and the more internally reliable the instrument is considered to be. The rule of thumb for interpreting Cronbach's alpha value is: α> 0.9 (Excellent), α> 0.8 (Good), α *>* 0.7 (Acceptable), α *>* 0.6 (Questionable), α *>* 0.5 (Poor), and α *≤* 0.5 (Unacceptable), as provided by George and Mallery (2003), and cited in Gliem & Gliem (2003).

The reliability of this study was measured by measuring Cronbach's alpha using SPSS for Windows. This calculation was performed by combining all 16 satisfaction scores together. The calculated Cronbach's alpha value 0.928 indicates an excellent internal consistency for the Likert-type scale with the participants’ satisfaction scores obtained in this study, suggesting the reliability of this instrument is excellent. It should be noted that when performing the split-half reliability test, the obtained satisfaction scores for all 16 scores were put together in the same order as they had been listed in the Shneiderman (1998) golden rules interface design. Thus, whatever the reliability found for the study is found is claimed to be calculated accurately.

**Working Definitions for the Independent and Dependent Variables**

Two independent variables (IVs) were considered for the purposes of answering the research questions in this study. The first IV was participants’ gender – a categorical variable with two categories: male and female. The second IV was participants’ self-reported college of major study area – categorized in two major: engineering and non-engineering.

The dependent variables (DV) of this study was the participants’ satisfaction of interaction with the Blackboard Learn user interface that was measured by calculating the median response of the 16 Likert-type scale items (item numbers 7 to 22 of the instrument) measured on a five-point scale. Due to the ordinal nature of the dependent variable, the non-parametric Wilcoxon-Mann-Whitney U test was carried out on median satisfaction scores by gender and major study area to determine if differences exist on these data across participants’ gender and major study area, respectively.

It is noted that for a Likert-type scale, data cannot be treated as an interval data as the distances between points on the scale are not equal (Cash, 2010). For instance, the mean or any number between *Totally Dissatisfied* to *Dissatisfied* is inherently meaningless with the Likert-type scale. Thus, in order to maintain meaningful and consistency of the dependent variable I would like to use individual participants’ median satisfaction scores instead of mean satisfaction scores, although mean satisfaction scores might allow me an easier interpretation with the corresponding parametric t-tests.

**Participants and Data**

During the fall 2012 semester 83 participants completed the survey. However, one participant completed only the demographic information and skipped the main part of the survey; so that was excluded from data analysis. Thus, there are 82 participants’ records presented hereafter in this paper.

Out of the acceptable 82 participants 46 (56.1%) were male and 36 (43.9%) were female. Seven (8.57%) of them were from College of Arts and Sciences; eleven (13.4%) were from College of Commerce and Business Administration; five (6.1%) from College of Communication and Information Sciences; sixe (7.3%) from College of Education; 38 (46.3%) from College of Engineering; eight (9.8%) from College of Human Environmental Sciences; five (6.1%) form College of Nursing; and two (2.4%) from Other colleges (see Table 1). Thus, in order to analyze the second research question, all participants are grouped into two major categories: engineering and non-engineering majors that comprised 38 (46.34%) and 44 (53.66%), respectively.

Table 1. College \* Gender Crosstabulation

|  |  |  |  |
| --- | --- | --- | --- |
| Major College of the Participants | Gender of the Participants | | Total |
| Male | Female |
| Arts and Sciences | 2 (2.4%) | 5 (6.1%) | 7 (8.5%) |
| Commerce and Business Administration | 9 (11.0%) | 2 (2.4%) | 11 (13.4%) |
| Communication and Information Sciences | 1 (1.2%) | 4 (4.9%) | 5 (6.1%) |
| Education | 2 (2.4%) | 4 (4.9%) | 6 (7.3%) |
| Engineering | 28 (34.1%) | 10 (12.2%) | 38 (46.3%) |
| Human Environmental Sciences | 0 | 8 (9.8%) | 8 (9.8%) |
| Nursing | 4 (4.9%) | 1 (1.2%) | 5 (6.1%) |
| Social Work | 0 | 2 (2.4%) | 2 (2.4%) |
| Total | 46 (56.1%) | 36 (43.9%) | 82 (100.0%) |

Among these participants, only two (2.4%) was faculty members; and five (6.1%) were freshmen; 37 (45.1%) were Graduate; 15 (18.3%) were junior; one (1.2%) was non-degree; 15 (18.3%) were senior; and seven (8.5%) were sophomore students (see Table 2).

Table-2: Level of Study \* Gender Crosstabulation

|  |  |  |  |
| --- | --- | --- | --- |
| Level of Study | Gender of the Participants | | Total |
| Male | Female |
| Faculty | 2 (2.4%) | 0 | 2 (2.4%) |
| Freshman | 4 (4.9%) | 1 (1.2%) | 5 (6.1%) |
| Graduate | 24 (29.3%) | 13 (15.9%) | 37 (45.1%) |
| Junior | 7 (8.5%) | 8 (9.8%) | 15 (18.3%) |
| Non-degree | 0 | 1 (1.2%) | 1 (1.2%) |
| Senior | 6 (7.3%) | 9 (11.0%) | 15 (18.3%) |
| Sophomore | 3 (3.7%) | 4 (4.9%) | 7 (8.5%) |
| Total | 46 (56.1%) | 36 (43.9%) | 82 (100.0%) |

Among these participants, 71 (86.6%) reported that their major role(s) of using Blackboard Lear was as student; only one (1.2%) as Course/Section Developer; two (2.4%) as Grader/Teaching Assistant; and eight (9.8%) has had multiple roles such as student, Grader/Teaching Assistant, and/or Section Developer (see Table 3).

Table 3. Major Role in Using BB Learn \* Gender Crosstabulation

|  |  |  |  |
| --- | --- | --- | --- |
| Major Role in Using BB Learn | Gender of the Participants | | Total |
| Male | Female |
| Course/Section Developer | 0 | 1 (1.2%) | 1 (1.2%) |
| Grader/Teaching Assistant | 2 (2.4%) | 0 (.0%) | 2 (2.4%) |
| Student | 39 (47.6%) | 32 (39.0%) | 71 (86.6%) |
| Multiple ( Such as, Student, Grader/Teaching Assistant, and/or Section Developer | 5 (6.1%) | 3 (3.7%) | 8 (9.8%) |
| Total | 46 (56.1%) | 36 (43.9%) | 82 (100.0%) |

**An Overview of the Satisfaction Scores**

Appendix-A presents an overview of the participants’ satisfaction scores towards the Blackboard Learn user interface. Participants responded to 16 specific questions (item numbers 7 to 22 of the instrument) designed to measure their satisfaction in interacting with the Blackboard Learn user interface. These questions included a 5-point Likert-type scale allowing participants to indicate whether they *Totally Dissatisfied, Dissatisfied, Neutral, Satisfied,* and *Totally Satisfied* to each item. These sixteen 5-point Likert-type scale items were combined to attain a median satisfaction score toward the use of Blackboard Learn. Each item was given a possible range of 1 to 5; where 1 indicated *Totally Dissatisfies* and 5 indicated *Totally Satisfied.*

As noted earlier, due to the ordinal nature of the Likert-type scale data of the dependent variable, I am using each of the individual participants’ median satisfaction scores of the survey items 7 to 22, shown in the very right column of the Table-AA in Appendix-A. Then for the simplicity of understanding and in order to carry out statistical tests the median satisfaction scores are presented by the working groups of the independent variables, as shown in the Table-AB in Appendix-B.

Descriptive statistics of these median satisfaction scores yields a mean, median, and mode of 3.88, 4.0, and 4.0 respectively with a standard deviation of 0.77 (Table 4). This indicates that the participants’ typical response is close to agreement that they are most likely overall satisfied with the interaction of Blackboard Learn user interface.

|  |  |
| --- | --- |
| Table 4. Descriptive Statistics of the Median Satisfaction Scores | |
| N | 82 |
| Mean | 3.872 |
| Std. Error of Mean | 0.849 |
| Median | 4.0 |
| Mode | 4.0 |
| Std. Deviation | 0.7690 |

**Results Specific to the Research Questions**

**Results of Research Question 1**

The first research question was: *Is there significant difference between male and female users’ satisfaction in using the Blackboard Learn user interface?* Results of this research question were carried out through a non-parametric Wilcoxon-Mann-Whitney U test on the median satisfaction scores grouped by gender, as shown on the left two columns of the Table-AB in the Appendix-B. The Wilcoxon-Mann-Whitney U test result (Table 5) indicates a non-significant difference (*N* = 82, *U* = 655.500, *p* =0.084>.05) that failed to reject the null hypothesis that the participants’ median satisfaction scores did not differ in terms of their gender.

|  |  |
| --- | --- |
| Table 5. *Wilcoxon-Mann-Whitney U Test Statistics for Median Satisfaction Scores on Participants’ Gender* | |
|  | Median Satisfaction |
| Mann-Whitney U | 655.500 |
| Wilcoxon W | 1736.500 |
| Z | -1.725 |
| Asymp. Sig. (2-tailed) | 0.084 |
| a. Grouping Variable: Gender | |

This meant that the study did not find any significant difference among the male and female participants’ satisfaction in using the Blackboard Learn. Again, based on the ranks of the median satisfaction scores by gender, as shown in Table 6, it also determined that male participants had a mean rank of 37.75 and the female participants had a mean rank of 46.29 for their satisfaction toward using the Blackboard Learn user interface. The difference between the mean ranks was not significant, either.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 6. Ranks of the Median Satisfaction Scores by Gender | | | |
| Gender | N | Mean Rank | Sum of Ranks |
| Male | 46 | 37.75 | 1736.50 |
| Female | 36 | 46.29 | 1666.50 |
| Total | 82 |  |  |

**Results of Research Question 2**

The second research question was: *Is there significant difference between engineering and non-engineering major users’ satisfaction in using the Blackboard Learn user interface?* Results of this research question were carried out through a non-parametric Wilcoxon-Mann-Whitney U test on the median satisfaction scores grouped by college of major (engineering or non-engineering), as shown on the right two columns of the Table-AB in the Appendix-B. The Wilcoxon-Mann-Whitney U test result (Table 7) indicates a non-significant difference (*N* = 82, *U* = 714.500, *p=*0.226>.05) that failed to reject the null hypothesis that the participants’ median satisfaction scores did not differ in terms of their major college groups.

|  |  |
| --- | --- |
| Table 7. *Wilcoxon-Mann-Whitney U Test Statistics for Median Satisfaction Scores on Participants’ Major College Groups* | |
|  | Median Satisfaction |
| Mann-Whitney U | 714.500 |
| Wilcoxon W | 1455.500 |
| Z | -1.209 |
| Asymp. Sig. (2-tailed) | .226 |
| a. Grouping Variable: Major College Groups | |

This meant that the study did not find any significant difference among the engineering and non-engineering college major participants’ satisfaction in using the Blackboard Learn. Again, based on the ranks of the median satisfaction scores by major college groups, as shown in Table 8, it also determined that college of engineer participants had a mean rank of 38.30 and the college of non-engineering participants had a mean rank of 44.26 for their satisfaction toward using the Blackboard Learn user interface. The difference between the mean ranks was not significant, either.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 8. Ranks of the Median Satisfaction Scores by Major College Groups | | | |
| **Major College Groups** | N | Mean Rank | Sum of Ranks |
| Engineering | 38 | 38.30 | 1455.50 |
| Non-Engineering | 44 | 44.26 | 1947.50 |
| Total | 82 |  |  |

**Results of Research Question 3**

The third research question was: *What are the major positive aspects and problems/limitations of the Blackboard Learn user interface?* Qualitative data obtained for this research question were summarized manually.

*Positive Aspects of the Blackboard Learn User Interface*

Participants found the Blackboard Learn user interface highly customizable, faster, user friendly, universal, well organized, very clean with elegant appearance. Blackboard Learn is easy to use, easy to viewing grades; and easy to type in and formatting text and attach assignment file. According to a participant, “It's smoothness and ease of maneuvering to your desired location. You do not have to go through tons of clicks to get to your destination.” According to another participant, “It's nice having mostly everything for all my classes all in one place. I like that when it logs you out, once you log back in it takes you to the same page.” Organization of coursework is better in Blackboard Learn, “I like that everything is in one place for each class.”, as mentioned by one participant. Another participant mentioned, “it has more use for larger sectioned courses more so than smaller section courses.” Infact, participants found its user interface as simple, user-friendly, and easy to navigate that does not require expert knowledge of navigating websites or using computers. Its log in is easy and easier and it does not kick the user log out from the system after a certain time.

According to some student participants, grade view in Blackboard Learn is better than eLearning as it “reveals the average grade of each course. Tracks progress as one works through an assignment.” According to another participant, “the Grade Center is much more capable than eLearning. For instance, the ability to ignore an attempt rather than just clear it. Also, jut the general grade entry and column organization.” According to some participant the Blackboard Learn seems more compatible with multiple modern browsers; and seems much more like a modern web-application than eLearning. They found it as better than eLearning, the previous online teaching-learning system.

According to the participants, the grade tracking facilities in the Blackboard Learn is well thought out and implemented; and the course layouts are consistence. One of the participants commented as, “Blackboard Learn is very easy to work with. The menu is very easy to use, to figure out where you need to go. Using the Blackboard Learn is very simple. This was my first online course to take and it was easy to figure out.” Another instructor participant commented as, “[It is] easy to organize materials for classes I teach. On-line grading of exams with feedback really simplifies thing for both the instructor and students. Ability the show or hide entire sections is easier in Blackboard.”

A number of student participants mentioned that, compared to eLearning, the Blackboard Learn interface is pretty intuitive, less kludge; better to use and for managing multiple course integration; has a much better grade center; and “the load of it is significantly faster than eLearning.” In Blackboard Learn, making comments on grade is more flexible; and it “allows for easy communication with teachers and other students.” Multiple participants found the integration of blogs, wikis, podcasts, and other web 2.0 applications, social networking technologies, as new and appealing. One participant mentioned, “the iPhone application and access through the Alabama iPhone app are useful too.” According to multiple participants, overall “Blackboard Learn is much better than eLearning.” One participant mentioned, “I wish all professors used it, so it was more universal. Also, I wish the My Grades part was always kept up to date.”

According to one student participant,

The new Blackboard Learn environment allows each professor to customize their course pages, which is good in some respects. However, this makes it difficult for users who have no standardization between course pages. Also, it seems professors are only using the course content page to post material and it gets crowded and unorganized. With the old system each there was pages for division of material, for instance, one page for lectures, one page for homework assignments etc.

A number of faculty, course/section developers, graders, teaching, and technical support assistants expressed some positive opinion toward Blackboard Learn user interface. For instances: The Blackboard Learn interface is highly customizable; Easy to use, has never been dysfunctional when I tried to use it; very clean, elegant appearance; Its grade center is much better than eLearning's; Comments on grades is more flexible; etc. One of them mentioned, “I feel the grade tracking facilities were very well thought out and implemented.”

*Problems/Limitations of the Blackboard Learn User Interface*

However, student participants reported a number of problems/limitations of Blackboard Learn such as: “you have to reload the page many times because it does not show all content at first” One participant reported Blackboard Learn as too slow. Another participant noted, “sometime it is difficult to find help items.” One participant reported Blackboard Learn times out after a while another participant reported is stays logged in for a while after the current window is closed. Another participant noted, it sometimes hangs up; ask for authentication to download files; and does not save username and password in user’s laptop. Another student mentioned, “I can't seem to find a way to remove classes I took over the summer from my "classes" view.” New users found some sort of difficulties in submitting the assignments as the Blackboard Learn does not highlight which assignments have passed the submission deadline, or due soon, or new.

A number of student participants mentioned the lack of discussion forums and non-interactive nature and Blackboard email and message communication features. One of the participants expressed his/her opinion on this as follows: Having a forum with appropriate administrative control (ability to create subforums and moderate all forum activities) for instructors would enable very open discussion between students as providing a facility for answering questions posed by a single student but visible to all students. Email is a good candidate for small discussion between a student and the instructor, but I would prefer to also have an open forum for more free discussion between students especially.

Institutional email interoperability was found one of the biggest issues in Blackboard Learn. Many student participants noted that the email and message system in Blackboard Learn are not interactive. One participating student noted that the email feature in Blackboard Learn is not very obvious and it feels odd to implement an email system which does not utilize the university email. According to another participant, “I have no way of knowing that I have a message from my teacher unless I look at it every day. Major hassle.” Another participant noted, “Blackboard is not as organized as e-learning. It is hard to find tasks. Also, I like how e-learning alerts you with a green dot whenever you have a task due.” Another participant mentioned, “Sometimes, it is not possible to add attachments to certain messages or emails sent within Blackboard Learn.”

One student participant mentioned:

The internal email announcements process does not alert the student when a new email or announcement is received. If a student doesn't check each class' email box they'll miss it. The group blogs, messaging/discussion boards, etc. work the same way. Some kind of alert process linked to crimson email or text should be in place to let the student know there's new content for them to view.

Another student participant mentioned:

According to the help webinar, the University did not buy the license that allows the home page to have notifications of "New" items to review. In eLearning you had a green asterisk that would appear next to email, grades, etc. You knew you needed to review those pages. In Blackboard, you have NO IDEA when something new appears. I had old emails waiting to be read. New assignments that hadn't made the calendar. It was a disaster.

S/he expressed his/her frustration as follows: “I called Suzanne Sawyer and Marilyn Staffo to complain on numerous occasions yet no one took my call. It was frustrating. The university needs to improve the system to make it more user friendly.”

Some of faculty, course/section developers, graders, teaching, and technical support assistants mentioned some problems/limitations of the Blackboard Learn. One of them reported that several features of eLearning are not possible with Blackboard such as: “adding auditors and making assignment submissions visible to all” Particularly, one technical support assistant mentioned, “There is no WYSIWYG editor for the modules like there was in eLearning, though I heard this may be provided in an update for our system. Because of this, any minor updates to HTML pages must be done externally.” One of the instructor participants noted an issue of inability to create gradebook columns that use multiplication or multiply two existing columns. S/he found it working offline with the gradebook is a bit of a pain. A technical support assistant mentioned,

There are little bugs that need fixed, like no discussion forums to read, yet you still get the icon on the homepage. I felt the biggest issue was the lack of interoperability between Blackboard Learn and the university email (xxx@crimson.ua.edu). The email feature in Blackboard Learn is not very obvious and it feels odd to implement an email system which does not utilize the university email.

S/he recommended:

In addition to syncing Blackboard Learn email with the university email (xxx@crimson.ua.edu) I would like a forum available which allows communications between students and instructors outside of the classroom and emails. Having a forum with appropriate administrative control (ability to create sub-forums and moderate all forum activities) for instructors would enable very open discussion between students as providing a facility for answering questions posed by a single student but visible to all students. Email is a good candidate for small discussion between a student and the instructor, but I would prefer to also have an open forum for more free discussion between students especially.

Another notable issue of the Blackboard Learn is that it is not very friendly to access via mobile devices. However, Blackboard Learn users expect that they should be able to access on it via mobile device. One of the participants noted this issue as follows: “In a perfect world we would all have access to a computer at all times, but emergencies do happen and preventing access to a class via mobile when all other facets of Blackboard are available is shortsighted.”

**Findings, Discussion, Implication, and Limitation**

This mixed-methods study evaluated first-time users’ satisfaction in using a new user interface of Blackboard Learn that is used as an online/blended teaching-learning management tool. The theoretical framework of this empirical study is based on Shneiderman’s (1998) *Golden Rules of Interface Design* that is considered as basic guidelines of the interface designers maintaining basic design pattern and user expectation for user interface design. Users’ satisfaction was measured in terms of the overall consistency, easiness of use, universability, positive aspects, and problems/limitations of the Blackboard Learn user interface; and was compared by participants’ gender and major area of study to determine if there exit any significant difference in their satisfaction among the possible groups in these measures.

The study was conducted to answer two quantitative and one qualitative research questions. Data for the study were collected through an anonymous online survey uploaded on Google Drive developed and conducted by the researcher, with an extensive help of the instructor. The Validity of this instrument was measured through the face validity process; and the reliability of this study was measured using Cronbach's alpha methods using SPSS for Windows, that suggests a poor reliability of study result. This might be either due to a poor internal consistency for the Likert-type scale with the participants’ satisfaction scores obtained in this study or due to the small sample size of the study.

Data for the quantitative research questions were collected quantitatively through a number demographic and sixteen 5-point Likert-type scale items; and data for the qualitative research question were collected qualitatively through two separate open ended questions using an online survey, developed and conducted by the researcher. These sixteen 5-point Likert-type scale items were combined to attain a median satisfaction score toward the use of Blackboard Learn. Each item was given a possible range of 1 to 5; where 1 indicated *Totally Dissatisfies* and 5 indicated *Totally Satisfied.* Due to the ordinal nature of the dependent variable, the non-parametric Wilcoxon-Mann-Whitney U test was carried out on median satisfaction scores by gender and major study area to determine if differences exist on these data across participants’ gender and major study area, respectively.

During the survey period, fall 2012, 82 participants completed the survey. Among them 46 (56.1%) were male and 36(43.9%) were female. By college-wise major, 38(36.34%) of them were engineering major- most of them were in Computer Science Major, and 44 (53.66%) were from non-engineering majors, respectively. Descriptive statistics of these median satisfaction scores yields a mean, median, and mode of 3.88, 4.0, and 4.0 respectively with a standard deviation of 0.77 (Tables 1-4). This indicates that the participants’ typical response is close to agreement that they are most likely overall satisfied with the interaction of Blackboard Learn user interface.

For the first research question: *Is there significant difference between male and female users’ satisfaction in using the Blackboard Learn user interface?* a non-parametric Wilcoxon-Mann-Whitney U test results (Table 5) indicated a non-significant difference (*N* = 82, *U* = 655.500, *p* =0.084>.05) that failed to reject the null hypothesis that the participants’ median satisfaction scores did not differ in terms of their gender. This meant that the study did not find any significant difference among the male and female participants’ satisfaction in using the Blackboard Learn.

Similarly, for the second research question: *Is there significant difference between engineering and non-engineering major users’ satisfaction in using the Blackboard Learn user interface?* a non-parametric Wilcoxon-Mann-Whitney U test on the median satisfaction scores grouped by college of major (engineering or non-engineering) results (Table 7) indicated a non-significant difference (*N* = 82, *U* = 714.500, *p=*0.226>.05) that failed to reject the null hypothesis that the participants’ median satisfaction scores did not differ in terms of their major college groups. This meant that the study did not find any significant difference among the engineering and non-engineering college major participants’ satisfaction in using the Blackboard Learn. There might have several reasons of these results such as: small sample-size, or poor internal consistency for the Likert-type scale with the participants’ satisfaction scores obtained in this study.

Analyzing the qualitative data, I have found that participants found the Blackboard Learn user interface highly customizable, faster, user friendly, universal, well organized, very clean with elegant appearance. Such as, is easy to use, easy to viewing grades; and easy to type in and formatting text and attach assignment file; etc. Compared to eLearning, the Blackboard Learn interface is pretty intuitive, less kludge; better to use and for managing multiple course integration; has a much better grade center; he load of it is significantly faster than eLearning; allows for easy communication with teachers and other students; etc. Also integration of blogs, wikis, podcasts, and other web 2.0 applications, social networking technologies, as new and appealing; and also the iPhone application and access through the Alabama iPhone app are useful too.

A few numbers of faculty, course/section developers, graders, teaching, and technical support assistants also expressed some positive opinion toward Blackboard Learn user interface. For instances: The Blackboard Learn interface is highly customizable; Easy to use, has never been dysfunctional when I tried to use it; Very clean, elegant appearance; Its grade center is much better than eLearning's; Comments on grades is more flexible; etc. One of them mentioned, “I feel the grade tracking facilities were very well thought out and implemented.”

However, a number of student, some of faculty, course/section developers, graders, teaching, and technical support assistants mentioned some problems/limitations of the Blackboard Learn. Such as: ..have to reload the page many times because it does not show all content at first; sometime it is difficult to find help items; times out after a while; does not save username and password in user’s personal laptop; and dies not remove classes of previous semesters from the classes view of students. Another mentionable problem was mentioned as the lack of discussion forums and non-interactive nature and Blackboard email and message communication features. Many student participants noted that they did not receive automatic email if an email or message was sent to them. There is no rich discussion forum to read. The existing discussion questions are very difficult to read, the thread is not set up in a user friendly way.

Similarly, some faculty, course/section developers, graders, teaching, and technical support assistants mentioned that several features of eLearning are not possible with Blackboard such as, adding auditors and making assignment submissions visible to all; and lack of WYSIWYG editor that they enjoyed in eLearning, the predecessor of Blackboard Learn. They also realized the lack of discussion forum and non-interactive features of the email and message features of Blackboard Learn. Some of them were expressed their frustration with the system bugs and these problems. Thus, they recommended for solving these issues as well as adding the features of interoperability between Blackboard Learn and the university email system. Blackboard Learn users expect some sort of alerts or notifications for the assignments and calendar boxes.

These might be due to the reasons that the new version of this Blackboard Learn has been adopted just in this semesters that has not been started using by all faculty and students. Although, the online survey is conducted only for limited time of two weeks and might not get attention to all of its users in the university campus. Moreover, with an experience of limited time handling, the users might not have realized all advanced and new features or advantages or limitations of the Blackboard Learn. These suggest me to keep the survey online and conduct it again in the next semesters among a large number of users. One implication of this study might be it can give a feed back to the UA and Blackboard Learn authorities for further modification, debugging, and improvement of the user interface. I would like to recommend for a replication or a similar study with further modification by other researchers in this or other institutions.

The main limitation of this study report is that it presents data found from a small sample 82 participants who have only a limited time experience of using Blackboard Learn. Thus, the findings of this study cannot be claimed to be generalizable. Moreover, given the quasi-interval type data of the dependent variables that were used to measure participants’ satisfaction toward the Blackboard Learn user interface, it was not possible for me to use more powerful parametric tests for analyzing quantitative data. Thus, the non-parametric Wilcoxon-Mann-Whitney U test, which is considered less powerful than the corresponding parametric t-test, was needed to use to analyze the first two research questions. Moreover, due to limited time, I could not use any control group for this study. Therefore, I am unable to compare the participating (treatment group) Blackboard Learn users’ satisfaction with another group (control group) of participants who do not have experience of using Blackboard Learn. Finally, I could not collect a sufficient number of faculty, course/section developers, graders, teaching, and technical support assistants’ experience and satisfaction to the use of Blackboard Learn.

**Conclusions**

This mixed-methods empirical study evaluated first-time users’ satisfaction of using a version of Blackboard Learn user interface that had been adopted as an online/blended teaching-learning management tool in fall 2012 at The University of Alabama in the southeastern United States. Users’ satisfaction was measured in terms of the overall consistency, easiness of use, universability, positive aspects, and problems/limitations of the Blackboard Learn user interface. The study found that the first-time Blackboard Learn users are most likely overall satisfied in using it without any significant difference among male vs. female; and engineering vs. non-engineering major users. Blackboard users are satisfied with a number of its advanced features, although they have reported some noticeable problems, limitations, and recommendations. In the perspective of mixed-methods study, finding of quantitative and qualitative results field similar or identical results.

Although there are some unavoidable limitations of this study such as small sample size, poor internal validity of the survey instrument, lack of control groups that do not allow me for the generalizability of this study, still these are scopes conducting this study again in the next semesters among a large number of users. Then a summarized report of this study could be a good feed back to the UA and Blackboard Learn authorities for further modification, debugging, and improvement of the user interface. Thus, I believe that findings of this study will be helpful to justify effectiveness, usability, and limitations/problems of the Blackboard Learning system; and make it better in future.

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**Appendices:**

Appendix-A: **A**n Overview of the Participants’ Satisfaction Scores towards the Blackboard Learn User Interface

| **Table .** **An Overview of the Participants’ Satisfaction Scores towards the Blackboard Learn User Interface** | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Gender** | **Major/College** | **Items in the Survey Instrument Pertaining to the Measurement of Blackboard Learn Users’ Satisfaction** | | | | | | | | | | | | | | | | **Median**  **Score** |
| **Q7** | **Q8** | **Q9** | **Q10** | **Q11** | **Q12** | **Q13** | **Q14** | **Q15** | **Q16** | **Q17** | **Q18** | **Q19** | **Q20** | **Q21** | **Q22** |
| 1 | M | Engineering | 5 | 3 | 2 | 4 | 5 | 4 | 4 | 3 | 3 | 2 | 3 | 3 | 5 | 5 | 3 | 4 | **3.5** |
| 2 | M | Engineering | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 3 | 5 | 5 | 5 | 5 | 3 | **5** |
| 3 | F | Engineering | 4 | 5 | 4 | 3 | 3 | . | . | . | . | 4 | . | 2 | . | . | 5 | . | **4** |
| 4 | M | Engineering | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | **4** |
| 5 | F | Non-Engineering | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | **4** |
| 6 | M | Engineering | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 3 | 4 | 4 | 4 | **4.5** |
| 7 | M | Non-Engineering | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | **5** |
| 8 | M | Engineering | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | **5** |
| 9 | F | Non-Engineering | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 3 | 2 | **5** |
| 10 | M | Non-Engineering | 4 | . | . | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | **4** |
| 11 | M | Non-Engineering | 4 | 3 | 4 | 4 | 4 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 3 | 4 | **4** |
| 12 | M | Non-Engineering | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | **4** |
| 13 | M | Engineering | 4 | 3 | 4 | 3 | 4 | 2 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | **3** |
| 14 | M | Engineering | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | **3** |
| 15 | M | Engineering | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | **3** |
| 16 | F | Engineering | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | . | 3 | 3 | 3 | 3 | 3 | **3** |
| 17 | M | Engineering | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | **3** |
| 18 | M | Engineering | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | **4** |
| 19 | M | Engineering | 5 | 3 | 4 | 2 | 3 | 4 | 4 | 2 | 4 | 3 | 2 | 4 | 3 | 3 | 3 | 3 | **3** |
| 20 | M | Engineering | 4 | 4 | 4 | 4 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 4 | 3 | 3 | **3.5** |
| 21 | F | Engineering | 5 | 5 | 4 | 5 | 5 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | **4** |
| 22 | M | Engineering | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | **3.5** |
| 23 | F | Engineering | 5 | 3 | 5 | 4 | 4 | 5 | 4 | . | . | . | . | 4 | . | . | . | . | **4** |
| 24 | M | Engineering | 5 | 4 | 1 | 4 | 3 | 2 | 2 | 3 | . | 2 | 2 | 3 | 3 | 2 | 3 | 2 | **3** |
| 25 | M | Non-Engineering | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | **4** |
| 26 | M | Engineering | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | **3.5** |
| 27 | M | Engineering | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 5 | **5** |
| 28 | M | Engineering | 4 | . | 4 | 4 | 4 | . | . | . | . | . | . | 4 | 4 | 4 | 4 | 4 | **4** |
| 29 | M | Engineering | 5 | . | 3 | . | . | . | 3 | 3 | 3 | 2 | 4 | 3 | 2 | 2 | 2 | 2 | **3** |
| 30 | M | Engineering | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | **4** |
| 31 | F | Non-Engineering | 5 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | **4** |
| 32 | M | Non-Engineering | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | . | 3 | 3 | 2 | 2 | 2 | 2 | 2 | **2** |
| 33 | F | Engineering | 5 | . | 5 | 4 | . | 3 | 2 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | . | . | **4** |
| 34 | M | Engineering | 5 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 5 | 3 | **4** |
| 35 | F | Engineering | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | **4** |
| 36 | F | Non-Engineering | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 2 | 3 | 3 | **5** |
| 37 | F | Non-Engineering | 5 | 3 | 2 | . | 4 | 2 | . | . | . | . | 4 | 2 | 2 | 3 | . | . | **3** |
| 38 | F | Non-Engineering | 5 | 3 | 2 | 4 | 2 | 1 | 4 | 2 | 3 | 2 | 4 | 1 | 1 | 1 | 3 | 3 | **2.5** |
| 39 | F | Non-Engineering | 5 | . | 5 | 4 | 4 | 5 | 5 | . | . | 4 | . | 5 | 3 | 3 | . | . | **4.5** |
| 40 | F | Non-Engineering | 5 | 3 | 5 | 5 | 5 | . | 5 | . | . | 5 | 5 | . | 5 | 5 | . | 5 | **5** |
| 41 | M | Engineering | 5 | 3 | 4 | 2 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | **3** |
| 42 | F | Non-Engineering | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | **4** |
| 43 | F | Non-Engineering | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | **5** |
| 44 | F | Engineering | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | **5** |
| 45 | M | Non-Engineering | 5 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 2 | 5 | 5 | **5** |
| 46 | F | Non-Engineering | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 5 | 4 | **5** |
| 47 | F | Engineering | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 3 | 3 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | **4** |
| 48 | M | Engineering | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 2 | 4 | 5 | 1 | 4 | 3 | 3 | **4** |
| 49 | F | Non-Engineering | 5 | 5 | 5 | 2 | 5 | 2 | 2 | 3 | . | 2 | 2 | 4 | 2 | 2 | 3 | 2 | **2** |
| 50 | F | Non-Engineering | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 1 | 4 | 4 | **4** |
| 51 | F | Non-Engineering | 3 | 3 | 1 | 2 | 4 | 1 | 4 | 1 | 4 | 2 | 3 | 2 | 1 | 1 | 1 | 3 | **2** |
| 52 | F | Engineering | 5 | 3 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | **5** |
| 53 | M | Non-Engineering | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 2 | 2 | 2 | 4 | **4** |
| 54 | F | Non-Engineering | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | **4** |
| 55 | M | Non-Engineering | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 5 | 4 | 5 | **4** |
| 56 | F | Non-Engineering | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 5 | 5 | **4** |
| 57 | M | Non-Engineering | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 3 | 5 | 4 | 5 | 4 | 3 | 4 | 4 | 5 | **4** |
| 58 | F | Engineering | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 2 | 2 | 2 | 5 | 5 | **4.5** |
| 59 | M | Engineering | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 3 | 3 | 3 | 3 | **3** |
| 60 | M | Engineering | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | **4** |
| 61 | M | Non-Engineering | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 |  | **4** |
| 62 | F | Non-Engineering | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | **4** |
| 63 | M | Engineering | 4 |  | 4 | 4 |  | 4 |  | 4 | 5 | 5 | 4 |  | 2 | 1 |  | 4 | **4** |
| 64 | M | Engineering | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | **3** |
| 65 | F | Non-Engineering | 5 | 3 | 4 | 5 | 5 | 4 | 2 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 2 | 3 | **4** |
| 66 | F | Non-Engineering | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 3 |  | 4 | 4 | 5 | 5 | 5 | 3 | 4 | **4** |
| 67 | M | Non-Engineering | 5 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |  | 3 | **4** |
| 68 | M | Non-Engineering | 5 | 3 | 5 | 5 | 5 | 5 | 2 | 3 | 3 | 3 | 3 | 5 | 4 | 5 | 5 |  | **5** |
| 69 | M | Engineering | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | **4** |
| 70 | F | Non-Engineering | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 2 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | **4.5** |
| 71 | M | Non-Engineering | 5 |  | 2 | 4 | 5 | 2 | 4 | 3 | 3 | 4 | 5 | 2 |  |  |  | 5 | **4** |
| 72 | F | Non-Engineering | 5 | 3 | 5 | 5 | 5 | 5 | 5 |  |  | 5 |  | 4 | 4 | 4 |  | 4 | **5** |
| 73 | F | Non-Engineering | 5 | 4 | 3 | 4 | 4 | 4 | 4 |  |  |  | 4 | 3 | 1 | 1 | 3 | 5 | **4** |
| 74 | F | Non-Engineering | 5 |  | 5 | 5 | 5 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 2 | 2 | 5 |  | **4** |
| 75 | M | Engineering | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | **4** |
| 76 | M | Non-Engineering | 3 | 3 | 1 | 3 |  | 2 | 2 | 3 | 2 |  |  | 3 |  | 4 | 2 | 3 | **3** |
| 77 | F | Non-Engineering | 4 | 3 | 4 | 4 | 3 | 2 | 4 | 4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 |  | **3** |
| 78 | M | Non-Engineering | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 5 |  |  | **4** |
| 79 | F | Non-Engineering | 5 | 3 | 4 | 4 | 5 | 3 | 4 | 3 | 3 | 4 | 5 | 5 | 3 | 4 | 3 |  | **4** |
| 80 | M | Non-Engineering | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3 |  | 3 | **4** |
| 81 | F | Non-Engineering | 2 | 3 | 3 | 4 |  | 4 | 2 |  |  |  |  | 5 | 2 | 2 |  | 4 | **3** |
| 82 | M | Non-Engineering | 3 | 3 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |  | **2** |
| **Median** | | | **4** | **4** | **5** | **3** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **4** | **3.5** | **4** |  |

## Appendix-B: Median Satisfaction Scores – grouped by the working variables

|  |  |  |  |
| --- | --- | --- | --- |
| Table AB. *Median Satisfaction Scores by Groups* | | | |
| Grouped by Gender | | Grouped by College of Major | |
| Male Participants | Female Participants | Engineering | Non-Engineering |
| 3.5 | 4 | 3.5 | 4 |
| 5 | 4 | 5 | 5 |
| 4 | 5 | 4 | 5 |
| 4.5 | 3 | 4 | 4 |
| 5 | 4 | 4.5 | 4 |
| 5 | 4 | 5 | 4 |
| 4 | 4 | 3 | 4 |
| 4 | 4 | 3 | 4 |
| 4 | 4 | 3 | 2 |
| 3 | 5 | 3 | 5 |
| 3 | 3 | 3 | 3 |
| 3 | 2.5 | 4 | 2.5 |
| 3 | 4.5 | 3 | 4.5 |
| 4 | 5 | 3.5 | 5 |
| 3 | 4 | 4 | 4 |
| 3.5 | 5 | 3.5 | 5 |
| 3.5 | 5 | 4 | 5 |
| 3 | 5 | 3 | 5 |
| 4 | 4 | 3.5 | 2 |
| 3.5 | 2 | 5 | 4 |
| 5 | 4 | 4 | 2 |
| 4 | 2 | 3 | 4 |
| 3 | 5 | 4 | 4 |
| 4 | 4 | 4 | 4 |
| 2 | 4 | 4 | 4 |
| 4 | 4.5 | 4 | 4 |
| 3 | 4 | 3 | 4 |
| 5 | 4 | 5 | 4 |
| 4 | 4 | 4 | 4 |
| 4 | 4.5 | 4 | 4 |
| 4 | 5 | 5 | 4 |
| 4 | 4 | 4.5 | 5 |
| 3 | 4 | 3 | 4.5 |
| 4 | 3 | 4 | 4 |
| 4 | 4 | 4 | 5 |
| 4 | 3 | 3 | 4 |
| 3 |  | 4 | 4 |
| 4 |  | 4 | 3 |
| 5 |  |  | 3 |
| 4 |  |  | 4 |
| 4 |  |  | 4 |
| 4 |  |  | 4 |
| 3 |  |  | 3 |
| 4 |  |  | 2 |
| 4 |  |  |  |
| 2 |  |  |  |
| **Male**  **sub-total = 46** | **Female**  **sub-total = 36** | **Engineering**  **sub-total = 38** | **Non-engineering**  **sub-total = 44** |

## Appendix-C: Survey Instrument

Please fill out this questionnaire based on your experience and perceptions of using the Blackboard Learn.

1. Please indicate your gender:  Male  Female

2. Please select a college related to your major area of study \*

 Arts and Sciences  Commerce and Business Administration

 Communication and Information Sciences  Education

 Engineering  Human Environmental Sciences

 Nursing  Social Work

 Undecided  Other: 

3. Please select your level of study at UA \*

 Freshman  Sophomore

 Junior  Senior

 Graduate  Other: 

4. How familiar are you with eLearning, the previous version of Blackboard Learn?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 |  |
| Not Familiar |  |  |  |  |  | Very Familiar |

5. How familiar are you with Blackboard Learn? \*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 |  |
| Not Familiar |  |  |  |  |  | Very Familiar |

6. Please indicate your major role in using Blackboard Learn: \*[Select All that Applicable to you]

 Student  Course/Section Developer

 Grader/Teaching Assistant  Guest

 Other: 

For each of the following questions, please indicate how satisfied you are with the simplicity of each of the following features in Blackboard Learn. [For any items with which you are unfamiliar, you can leave them blank.]

|  | Totally Dissatisfied | Dissatisfied | Neutral | Satisfied | Totally Satisfied |
| --- | --- | --- | --- | --- | --- |
| 7. Log in/ log out process |  |  |  |  |  |
| 8. Password recovery process, if needed |  |  |  |  |  |
| 9. Course Home Page |  |  |  |  |  |

For each of the following questions, please indicate how satisfied you are with each of the following aspects of Blackboard Learn. [For any items with which you are unfamiliar, you can leave them blank.]

|  | Totally Dissatisfied | Dissatisfied | Neutral | Satisfied | Totally Satisfied |
| --- | --- | --- | --- | --- | --- |
| 10. Consistency in the various forms/steps while doing something |  |  |  |  |  |
| 11. Universability of the interface, regardless of user's gender, race, physical ability, etc. |  |  |  |  |  |
| 12. Seeing progress bar/ visual feedback in performing a task |  |  |  |  |  |
| 13. Easiness in the sequence of actions needed to submit an assignment |  |  |  |  |  |
| 14. Error prevention techniques |  |  |  |  |  |
| 15. Easiness of fixing error |  |  |  |  |  |
| 16. Having your own control over the system |  |  |  |  |  |
| 17. Not to remembering too much information from previous steps in completing a task |  |  |  |  |  |

For each of the following questions, please indicate how satisfied you are with the usefulness of each of the following features in Blackboard Learn. [For any items with which you are unfamiliar, you can leave them blank.]

|  | Totally Dissatisfied | Dissatisfied | Neutral | Satisfied | Totally Satisfied |
| --- | --- | --- | --- | --- | --- |
| 18. My Grades view |  |  |  |  |  |
| 19. Message Communication feature |  |  |  |  |  |
| 20. Email Communication feature |  |  |  |  |  |
| 21. Using blogs, wikis, podcasts, and other web 2.0 applications |  |  |  |  |  |
| 22. Using Help menu of the system |  |  |  |  |  |

23. What are some positive aspects of Blackboard Learn?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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24. What are some problems or limitations with Blackboard Learn?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25. Please feel free to provide your own statements that are not mentioned in this survey, if any.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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