Performance Evaluation and Measurement of Learning Management System Through Usability, User Interface, and User Experience

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Summary

e-Learning can offer a learning experience free of time and distance constraints. With the introduction and widespread use of electronic devices and ubiquitous computing, the concept of e-Learning has engaged in a whole new sense, enabling people to communicate with e-Learning programs in a variety of ways. Simultaneously, it has compelled the course's designers to select the most appropriate technology from among the multitude of technologies accessible for the storage and delivery of knowledge representation. The Blackboard system currently has a recognized position in the knowledge administration of the education system as a learning management system (LMS). Blackboard offers classroom teaching, correspondence, and evaluation mechanisms that are both effective and simple to use. Blackboard Ally helps universities build a more welcoming teaching and learning environment by making interactive course material more available. Blackboard Ally is a one-of-a-kind program that seamlessly integrates with the virtual learning environment (VLE) and operates inside the workflows that administrators, teachers, and students are already familiar with. This study will look into the effective implementation and evaluation of Blackboard Ally among academics at Jazan University. The primary goal of this study is to assess the usability, user interface, and user experience of a Blackboard Ally environment by administrators, faculty members, and students of Faculty of Arts and Humanities courses. The results proved the hypothesis that Blackboard Ally is accessible and usable by the teachers for the delivery of content in the Jazan University. According to my knowledge and literature review, this is the first research article to evaluate the performance and measurement of Blackboard LMS through Usability, User Interface, and User Experience.

Key words:
Artificial Intelligence; Learning Management System; Blackboard; User Interface; User Experience.

1. Introduction

Education is one of the most important factors in the development of a strong country and a pillar of every country on the planet. Education, in its most fundamental form, is a method of learning in which a group's practices, experience, and skills are passed on from generation to generation by studying, teaching, and/or training. Although most education is done with the help of others, it can also be done on one's own. Learning takes place in two ways: first, as students collaborate and discuss ideas and hypothetical concepts, and second, as students associate with other students from all around the world on topics of study [1, 2].

In educational settings, the exponential progress of information technology has transformed teaching and learning approaches. Several reports show that the number and efficiency of e-Learning tools in higher education, such as Blackboard, have significantly improved over time. Students and teachers enter this shared learning space together to make meaningful contact with one another by way of conversation, podcasts, message forums, and file sharing. Indeed, the adoption of Blackboard has revolutionized conventional instructional methods, resulting in efficient educational data processing [3, 4].

The use of learning management systems (LMSs) is not restricted to educational institutions such as universities and schools. Organizations and government agencies have also used similar platforms to encourage employees to continue their education and training. As a result, appropriate approaches for evaluating these platforms are required to enhance their quality, as well as the learning and teaching process through them [5]. The quality of LMSs and the learning process are heavily influenced by usability, user interface (UI), and user experience (UX). Where usability is concerned with the practical elements of a user's activities and their completion, UI/UX is concerned with the subjective aspects of a user's feelings and stimulations while engaging with a product. When using an LMS, the student must not only understand the content of the disciplines but also how to operate the platform. If an LMS does not have excellent usability, the student will spend more time trying to figure out how to use it instead of absorbing the instructional material. A strong UI/UX is also necessary to make the platform more enjoyable and satisfying for the student. The platform would be considerably more appealing to the user if it was both usable and fascinating [6, 7].

Survey questionnaires are frequently used to examine the usability and quality of LMS products as direct assessment and measurement methods. They provide a quantitative study of LMS features and functions and also offer a qualitative method for assessing user perception and overall perceptions. UX refers to how users feel about an

LMS before, during, and after using it. Different users or groups of users may rate the same LMS, yet their experiences may differ significantly. Efficiency, efficacy, learnability, perspicuity, and controllability are all characteristics of usability [8]. In recent years, there has been a clear trend to broaden the definition of usability to include a more comprehensive perspective of human-system interactions, referred to as user experience.

2. Literature Review

According to research, online learning enhances information processing and saves time. The advancement of contemporary instructional information-communication technologies provides the opportunity to improve higher education quality. Certainly, the pedagogically proficient application of these instruments will represent a significant step forward in the personalization of the educational process, assisting in the reduction of the cost of the mass-production teaching framework [9]. In a humanitarian sense, education's informatization poses a severe challenge to modern higher education, serving as a type of litmus test for its pedagogical competence. The utilization of digital, virtual, and network information systems, as well as the development of high-performance computers in the new decades and the expansion of the Internet (particularly the "fast Internet"), are all significant advances in education [10 11].

The usage of new technologies in higher education is increasing all around the world. Educators are embracing technology like Facebook, which their students utilize in their social life, for informal and formal learning, sometimes inspired by their students. Emerging technologies are defined as those that have the potential to have a significant influence on teaching, learning, or creative research on university campuses. Emerging technologies provide a more customized, adaptable, and differentiated focus on learning requirements and pedagogy, rather than a "one-size-fits-all" Approach managed by teachers. Collaboration, co-creation, learning, and engagement are all possible through social media, which contributes to better teaching and learning [12].

2.1 Artificial Intelligence is the Hottest Buzzwords

Deep Blue, an IBM-developed artificial intelligence, defeated global chess champion Garry Kasparov in May 1997, marking a huge symbolic achievement in computing technology. Deep Blue achieved this achievement by employing a brute force technique that allowed it to quickly compute thousands of different moves and select the ones that were most likely to win. AI has lately been tasked with solving the Chinese board game Go. Unlike chess, which has a set of rules that must be followed, Go is an open-ended game with few rules and a wide range of possibilities. After

brute force techniques failed, the programmers turned to neural networks to teach the AI, AlphaGo, how to play strategy by playing tens of millions of games against itself [13].

Fig. 1 Artificial Intelligence in the e-Learning [2]

Although the popularity of AI has been boosted by beating grandmasters at some of the oldest and most difficult games of humanity, it has also been put to more realistic use. Artificial intelligence can currently identify some diseases earlier and more correctly than professionals in the field of medicine. Meanwhile, a pair of Facebook chatbots built to interact with one another rapidly developed an unsettling coding language. AI's full powers have yet to emerge as a new technology. It's also evident that when they improve and become more accessible, they'll have a lot of uses in online education. AI's power may also be employed in e-Learning. By utilizing the benefits of this new technology, the e-Learning environment has the potential to grow at a rapid rate. By gaining access to the benefits of this new technology, the e-Learning environment has the potential to grow at a rapid rate as illustrated in Fig 1. AI can have a five-fold impact on e-Learning: real-time questioning, natural language processing, improve accessibility, generate fresh content, and personalize learning [14].

2.2 Usability, User Interface, and User Experience (UI/UX)

In e-Learning, usability refers to both the way material is presented and the content itself. In the ISO 9241 standard, usability is defined as: "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use". Additional qualities like entertainment, ease to learn, and mistake tolerance can be added to this description [15]. According to [16] usability is based on user input through assessment rather than just trusting the designer's knowledge and skill. Usability testing is observing how real-world consumers interact with a product and using what is learned to enhance the product.

He also mentions that three elements should be considered while designing a user interface: content presentation, user approaches (interaction techniques), and technology [17].

A user is an individual (for example, a university student) who utilizes an LMS (Blackboard Ally) to complete their e-Learning education and training. Other possible users of Blackboard Ally, such as instructors and system administrators, are acknowledged in this study. Furthermore, "all facets of how people use an interactive product - how it feels in their hands, how well they comprehend how it works, how they feel about it while using it, and how the product is perceived, understood, and used" are included in UX. In this study, UX of Blackboard Ally is defined as a fuzzy, multi-faceted, context-dependent, and dynamic concept that encompasses all aspects of how end-users interact with, perceive, feel, and think about Blackboard Ally, as well as how they reflect on, anticipate, and use it to achieve hedonic and/or functional value of e-Learning [18].

Traditional web design is not the same as web-based learning. The designer should think about instructional design methods and learner experiences while creating online learning tools. When it comes to creating effective e-Learning systems, the learners' experience is crucial. One of the most challenging jobs is evaluating the usability and UX of e-Learning. A survey evaluation, which employs a questionnaire to determine how much consumers learn from the e-Learning course, is one of the assessments. Aside from the preceding explanation of UX and usability, it's also vital to include user-centered design (UCD) as a key component of the UX paradigm. A trained researcher observes and/or interviews predominantly passive or reactive users, whose contributions are limited to doing prescribed tasks and/or providing feedback on product concepts that were not produced by the users [19]. Furthermore, UCD may be defined as a wide word that encompasses a broad philosophy, as well as several methodologies and approaches to design processes, in which users are involved in a variety of ways. UCD is a three-phased iterative technique.: (1) user knowledge (gathering requirements by watching and interviewing end-users and other stakeholders), (2) defining interaction (building use cases based on phase one's output), and (3) UI design (iterative creations and evaluations of prototypes). UCD then supports in the design of the product to suit user wants while also taking organizational goals into consideration, providing value for both sides [20].

2.3. Blackboard Tools Guide

Matthew Pittinsky and Michael Chasen, two education advisers, created Blackboard LLC in 1997 as a consultancy business to offer technological standards for online learning systems. The IMS Global Learning Consortium, a worldwide non-profit organization inside Educause's National Learning Infrastructure Initiative, hired Blackboard LLC. Blackboard's goal was to make it easy for college teachers to publish course materials such as syllabi, reference sites, and study aids on the Internet [21]. In 1998, Blackboard merged with CourseInfo LLC at Cornell University, a course management software provider and start-up firm, and the merged company soon launched its first online learning software product. The continued development of Blackboard and the widening public image is guided by acquisitions. The Blackboard empire comprised over 12 million users in over 60 countries. Services are sold to more than 2,200 learning institutions in 12 languages and contain over 2,500 supplements from educational publishers [22].

Blackboard Ally helps universities achieve a more balanced teaching and learning experience by generating more open content for interactive classrooms. Blackboard Ally is a unique technique that seamlessly integrates with the Virtual Learning Environment (VLE) and works inside the workflows that students and teachers are already familiar with. Most educational technology suppliers have traditionally focused on the platform's accessibility, leaving the content to be a black box [23]. This constituted an obvious and significant impediment to establishing a welcoming learning environment for all learners. By concentrating on the content within those systems, Blackboard Ally seeks to close that gap. Blackboard Ally was created to assist institutes in better understanding and addressing the accessibility of course material for all students. The notion that accessibility should not be limited to people with impairments was one of the motivating reasons for the invention. Accessibility should be about making education more accessible to everyone and improving the educational experience [24].

Approaches to instruction provide a range of ways of teaching that could inspire and promote self-guided pedagogy. Today, the use of e-learning programs such as Blackboard has been introduced by the educational institutions of the world as part of their instructional activities. In the effective use of e-learning tools, machine knowledge is a critical influence on faculty members. Blackboard Learn has a solid collection of instruments and the potential to incorporate additional resources to the platform. You can access the tools list on the Tools tab. Each row displays authenticated users, visitors, and observers the availability of the instrument. Blackboard Ally is a platform that interacts with your Learning Management System (LMS) effortlessly to gain insight into the usability of your organization [25]. Blackboard Ally integrates with your Learning Management System (LMS) to determine how accessible your content is. Ally offers advice and suggestions for making your material more accessible in the long run [26]. Ally makes alternate files that are more user-friendly for all students. Inside your

online course, Ally works so that it is accessible right where you need it [27].

3. Theoretical and Institutional Framework

By endorsing usability, user interface, and user experience, this study employs qualitative and quantitative knowledge to look into how well Ally integrated software works with Blackboard LMS. Fig. 2 shows the theoretical model of the integrative Blackboard through usability, user interface, and user experience.
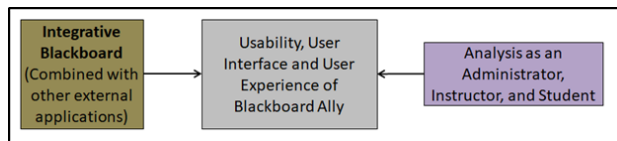

Fig. 2: Usability, User Interface, and User Experience Evaluation Model

The capabilities discovered in the interactive Blackboard can be utilized in the Integrative Blackboard, therefore this study focused on that [28]. The analysis of Blackboard Ally usability, user interface, and user experience evaluation can be classified into three types: Analysis as an administrator, instructor, and student. Integrative Blackboard has the following characteristics:

- Allows Blackboard to be used in conjunction with other programs or software like Ally, Respondus, and Prometric test engines.
- Allows students to obtain course materials in the right format, take tests, and participate in online seminars.
- Limitations such as plagiarism, learner devotion, data security, and confidentiality are addressed.
- Students should be protected during their educational years.

The study's main contribution is to look into the performance evaluation of Blackboard Ally based on usability, user interface, and user experience during the semester by survey questionnaires.

4. Methodology

The study's purpose was to look into Blackboard Ally's usability, user interface, and user experience for online undergraduate courses at Jazan University. The study's goal was to look at the effects of including Blackboard Ally on teaching and learning. The aim of this analysis is to be carried out using a hybrid paradigm with quantitative and qualitative approaches.

4.1. Blackboard as an e-Learning Tool

Blackboard was used as the e-Learning delivery technology for this project. Since most students at Jazan University use it as a supplementary to traditional study, it has become quite popular. It is also widely utilized as an e-Learning platform and/or as a complement to traditional teaching and learning by a large number of educational institutions throughout the world. Students at Jazan University mostly use Blackboard to submit online assignments for courses in which they are enrolled. Syllabi, My Grade, Lectures, Glossary, References, and Presentations are some of the other features; assessment tools like Online Quizzes, Assignment Submission, Self-test, and others; and communication tools like Mail, Chat, Bulletin Board, and Discussion are some of the others. Blackboard is also used by faculty members and teaching assistants for organizing, importing, and creating course materials, as well as other course-related tasks.

4.2. Statistical Analysis of Blackboard Ally

In essence, qualitative analysis implies evaluating anything based on its quality rather than its quantity. We explore how we characterize things when we perform qualitative analysis. We can't always explain those things using numbers or numerical phrases. We use descriptions when doing the qualitative study. Feelings, ideas, and perceptions are all things we operate with. We try to figure out what motivates people and what makes them act the way they do. Quantitative analysis is the polar opposite of qualitative analysis; it measures quantity rather than quality. We look at facts, measurements, statistics, and percentages when we perform quantitative analysis. We deal with numbers, statistics, formulas, and data when doing quantitative work. In public relations, both qualitative and quantitative analyses are critical.

4.3. Usability, User Interface, and User Experience of Blackboard Ally

In this article, the usability, user interface, and user experience questionnaire are used to evaluate and quantify Blackboard Ally. The questionnaire was developed for such scenarios and the evaluation of usability, user interface, and user experience This questionnaire provides for a rapid assessment of any interactive product's user experience. The questionnaire's scales were designed to capture a complete picture of the user's experience. The questionnaire's style encourages users to communicate sentiments, perceptions, and attitudes that occur as a result of using a product right away. The questionnaire can also be completed as an online form. It can be completed by a group user in a few minutes

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4.4. Study Area and Number of Participants

The study was conducted in the fall semester of the academic year of 2020-21. The target population was full-time faculty members and students at Jazan University's Faculty of Arts and Humanities. Survey questionnaires were completed by 55 faculty members and 163 students from the three departments of the Faculty of Arts and Humanities, accounting for more than 61 % (percent) of the Faculty of Arts and Humanities community. The questionnaire was sent to all faculty members and students to complete and submit. However, 13 instances were recognized as outliers and incomplete, and they were removed from the dataset to reduce the number of false population conclusions. As a result, there were 52 staff members and 153 students in total. Faculty members and students should be computer savvy and have access to the Internet to fulfill the research study's primary aim.

4.5. Data Gathering, Authenticity and Reliability

Study design necessitates the elicitation of evidence from many sources to construct a strong argument. To that aim, the data for this study was gathered through Blackboard Ally Administrator reports of the course lectures and an anonymous survey form filled out by faculty members and students.

When collecting exploratory, explanatory, or descriptive data, anonymous surveys are a good way to go. Qualitative surveys are a type of data collecting technique that is intended to elicit information about a sample population's experiences and meaning-making processes concerning a certain issue. The survey was conducted online and disseminated to 218 faculty and student participants using the Blackboard system, which collected structured data via open-ended questions and Likert scale alternative ordinates. The purpose of the study was to see how successful the features and components of Blackboard Ally are in improving academic achievement and satisfaction. The total number of survey replies was 205, indicating a 96.7% response rate.

Qualitative data, unlike quantitative data, is susceptible to the researcher's creation and interpretation of meaning, as well as that of the study participants. To check data gathered in a qualitative sense, qualitative content analysis (QCA) was employed. This study will use thematic content analysis, which is a validity evaluation method that can handle large amounts of data. A reliability evaluation was conducted to determine the validity and consistency of the items used for the quantitative element's variables. Cronbach's Alpha was used to conduct an authenticity and reliability check because this method is most commonly used to assess the internal consistency of a questionnaire (or survey) that is made up of multiple Likert-type scales and items.
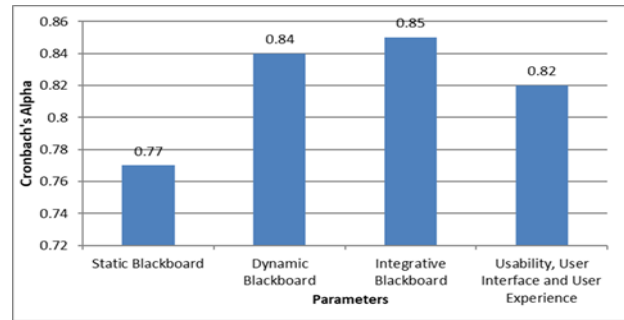

Fig. 3. Values of Cronbach's Alpha

Cronbach's Alpha readings between 0.6 and 0.7 are considered to be the lowest range of acceptable. If Cronbach's Alpha is greater than 0.7, the variables are stable, and the same homogeneity may be estimated. Because all Alpha ratings are above 0.7, as shown in Figure 3, these results demonstrate that the questionnaire is a trustworthy instrument that may be used in this investigation.

5. Findings and Discussions

This section summarizes the outcomes of research conducted at Jazan University is to evaluate the use of Blackboard as a learning management system and the influence of the Ally integrative tool on usability, user interface, and user experience.

5.1. Demographic Analysis

Demographic research necessitates the acquisition of objects that aid in the quantification of societal measures and dynamics. These approaches were created to analyze human populations, but they have since been used in a wide range of fields where researchers aim to understand how populations of social actors evolve. Because of the disparities in race, educational background, and computer proficiency among faculty members, it was predicted that there would be some differences in how they used Blackboard.

5.2. Number of Participants

The utilization of Blackboard Ally among staff members and students is seen in Fig. 3. It may be inferred that technology utilization is not department-specific, hence departments had no influence on the adoption of Blackboard Ally.
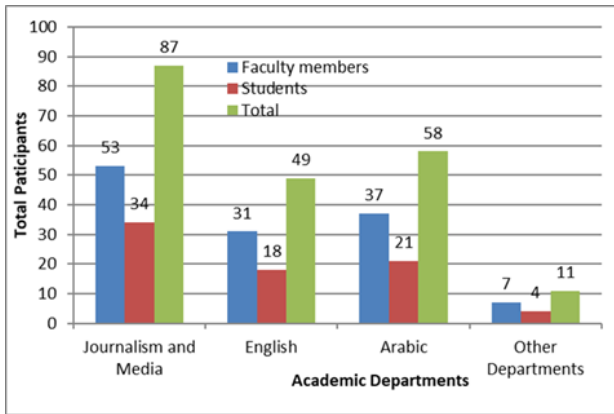
Fig. 4: Participants of Faculty of Arts and Humanities

The results in Fig. 4 show the various levels of computer skill among faculty members and students. Expanded innovative proficiency among faculty members and students is critical in higher education, where hi-tech innovations have a transformative influence on learning and teaching.
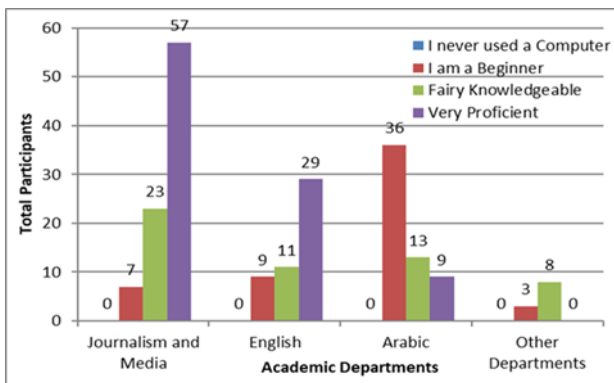

Fig. 5: Computer Knowledge

In several countries, the value of educators' information and communication technologies (ICT) abilities has been contested, with many experts suggesting that "instructors should be able to cope with innovation with confidence". One of the primary strategies of reasoning for the development of instructors' ICT-related abilities is to increase students' learning results and ICT competence. This evaluation is based on the fact that they are much older than digital natives and may take longer to grasp new technology. Apart from instructor and student computer literacy, the writers' computer proficiency is also required to completely appreciate the learning management system and its capabilities. All of the authors are employed at Jazan University's Deanship of e-Learning and Information Technology, and they are experts and confident in computer proficiency as a result of their education and professional

working environment in the field of information and communication technology (ICT).

5.3. Academic Analysis of Blackboard Ally

Using e-learning applications like "Blackboard" helps to lower the cost of recreating information, which contributes to successful knowledge management. Despite the advantages of e-learning for students, learners, and institutions, it raises fundamental questions about how people learn. Blackboard Ally is a software program that works in tandem with your Learning Management System (LMS) to offer data about the usability of your school. This section shows the analysis as an administration, instructor, and student.

The semester accessibility report for the fall semester of the academic year 2021-22 at Jazan University in Saudi Arabia is shown in Fig. 6, where the Blackboard Ally tool is used by 9,679 enrolled courses. According to the Ally group, the total material provided by these courses is 134,827, and the overall accessibility score of these courses and course contents is 45.3 percent, which is a very excellent score. Table. 2 explains the administrator's satisfaction level for Blackboard Ally-registered courses.

Fig. 6: Accessibility Report of Fall Semester 2021-22

Table 1: Administrator's Analysis

Satisfaction Level	Agree	Disagree	Don't Know
Accessibility are beneficial	Yes	No	No
Accessibility information is adequate	Yes	No	No
Accessibility report is helpful	Yes	No	No
Ally usage contents are acceptable	Yes	No	No

Table. 3 shows a full college-level course analysis. The College of Science is the most popular college, with 1,826 sections/courses in total, however only 1,554 of them have

files. These sections include a total of 27,820 files, which have been downloaded 278 times by students using the Ally tool. Among all colleges, the College of Design and Architecture has the fewest sections/courses, with just 364 sections/courses having the files. There are 263 files altogether in 364 sections/studies, and students downloaded these materials 33 times via Ally during their courses. Apart from these colleges, the College of Computer Science and Information Technology contained 24,908 files in its 1,098 sections/courses, which were downloaded 417 times.

Table 2: College wise detailed course analysis

List of Colleges	Total Sections/ Courses	Number of Sections with Files	Number of Sections with Files	Total Files	Downloads files by students using Ally
Engineering	1232	624	608	1233	120
Science	1826	1554	272	27820	278
Computer Science and	1191	1098	93	24908	417
Design and Architecture	364	263	101	2788	33
Medicine	480	34	446	1075	30

Ally creates various forms for the course content based on the original. These formats are made available for the original materials so that students may find everything in one spot. The instructor is not required to do anything; Ally creates these alternate forms for the teacher. The teacher can block other formats for any content item if they desire to for whatever reason. The distributions by alternate format type are shown in Tab 4. These various formats are utilized to help them learn more effectively. In the browser window and on mobile devices, HTML and BeeLine Reader are available. The remaining format types need device downloads.

Table 3: Alternative format type distribution

Total Courses	Tagged PDF	OCRed PDF	HTML	ePub	Braille	Audio	Beeline Reader	Translated Version
5,485	19,620	1,332	9,540	2,493	535	241	543	0

Table. 5 shows the alternative format utilization data over time for the fall semester of the 2020-21 academic year at Jazan University. These figures represent a nine-week report; the sixth week of this semester had the highest number of course file launches and downloads, with 5,316 and 3,038 respectively. The number of launches was 2,272 in the first week, and the number of file downloads was 1,292. The sections/courses have a light burden due to the start of the semester.

Table 4: Usage of alternative formats over time

Weeks (Selected)	Launches	Downloads	Total Unique User Downloads
8/23/2021	615	411	200
8/30/2021	3767	2456	950
9/6/2021	3252	2016	899
9/20/2021	2429	1459	689
10/4/2021	4260	2402	1112
10/18/2021	3533	2285	854
11/1/2021	2789	1942	747
11/15/2021	3413	2311	842
12/6/2021	3029	2128	715
12/13/2021	2494	1837	598

5.4. Usability, User Interface and User Experience Analysis of Blackboard Ally

Faculty members and students have been using Blackboard Ally often in their teaching and learning processes during the academic semester, according to the research. All faculty members and students received prior training on how to use Blackboard Ally during orientation meetings, and they are well aware of the benefits of using this integrative technology.

Most faculty members use Blackboard to accelerate their courses at least 2–3 times a week or more, according on Blackboard Ally usage, as shown in Fig. 7. Using e-Learning applications like "Blackboard Ally" helps to lower the cost of recreating information, which contributes to successful knowledge management. Despite the benefits of e-Learning for students, learners, and institutions, it raises basic issues about the learning process. Blackboard Ally is

a tool that seamlessly integrates with LMS's to provide information about an institution's usability. Administrators, faculty members, and students may learn about the usability and user experience of Blackboard Ally in this area. As a result, the researcher used a questionnaire with questions on functionality, design/layout, outcome, and accessibility to assess the number of items. The questionnaire was also utilized by the researcher to gauge user satisfaction as well as the utility of the Blackboard Ally in answering the study's questions. The data collected was usability, user interface, and user experience surveys.
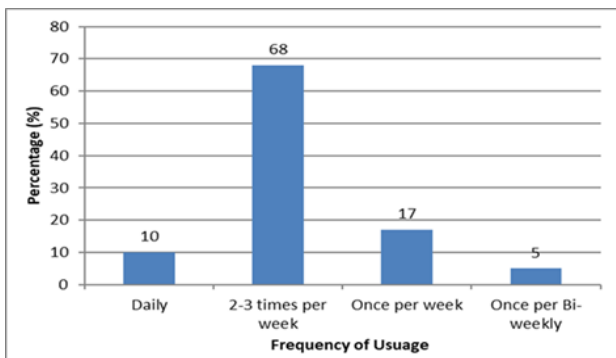

Fig. 7: Usage of Blackboard by Participants

The questionnaire was used to gather data, and the replies were rated on a scale of 1 to 5 using the Likert scale, as shown below.

1. Strongly disagree
2. Disagree
3. Neither agrees nor disagrees
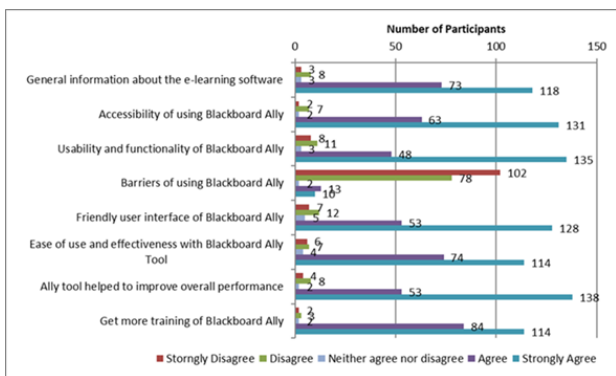4. Agree
5. Strongly agree

Fig. 8: Usability Analysis of Blackboard Ally

The researchers created a questionnaire to assess Blackboard Ally's usability and accessibility. The questionnaire included eight survey questions as shown in Fig. 8. The interface design, interactive usage of the interface components, and the usefulness of the navigational elements to access instructional contents are all usability and accessibility features. The outcome of the user interface evaluation is shown in Fig. 9. The results suggest that the user interface is satisfactory on a scale of agree to strongly agree.
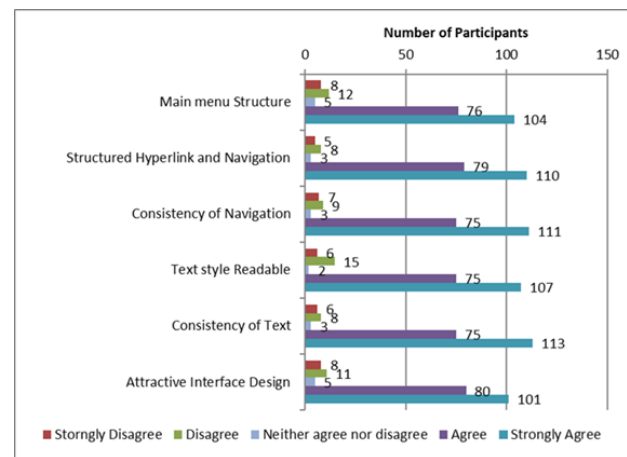

Fig. 9: User Interface Analysis of Blackboard Ally

In addition, respondents were asked to score the program on a scale of 1 to 5 using the Likert scale on the interface layout. The findings were evaluated, and it was discovered that the software interface's general layout and design are user-friendly. Users can easily interact with the system by posting information on discussion boards, blogs, creating to-do lists on the dashboard, previewing assignments that have been posted by teachers, reviewing course materials and newly posted notifications, and easily accessing and tracking grades through the interface. The user experience questionnaire's items are given in a randomized order. As shown in Fig. 10, the items demonstrated the users' opinion and their orientation. The survey differentiates between an LMS's perceived pragmatic quality, perceived hedonic quality, and perceived appeal. The survey assumed that pragmatic and hedonic qualities are self-contained characteristics of the user experience.
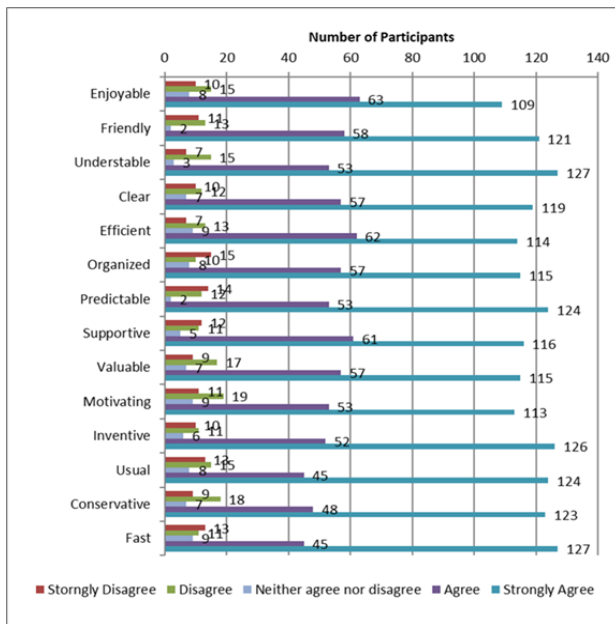
Fig. 10: User Experience Analysis of Blackboard Ally

Pragmatic and hedonic qualities are two terms that describe various aspects of quality. Six (6) categories and fourteen (14) assessment items made up the user experience questionnaire. Attractiveness is a pure valence dimension such as enjoyable, and friendly. Perspicuity is related to easiness and familiarity with the tool, the items are: understandable, and clear. Efficiency is related to the level of performance or the quality, the items include: fast, efficient, and organized. Dependability is related to the user feeling in control, secure, and predictable during interaction with the tool, the parameters are: predictable and supportive. Stimulation is to figure out interesting and exciting users to use the Blackboard Ally, the items include: valuable, and motivating. Novelty to investigate creativity, innovatively of the tool design, the items include: inventive, usual, and conservative.

5. Conclusions and Future Works

The Saudi Arabian advanced education framework will have to take extraordinary measures to address the challenges that higher education will face in meeting the country's growing needs and fulfilling Crown Prince Muhammed bin Salman's vision for the kingdom. Leaders in higher education must take bold actions in the next years to meet rising educational needs by improving their performance with top attribute outcomes.
The purpose of this study is the evaluation and measurement of Blackboard Ally based on usability, user interface, and user experience have been presented and how Blackboard

Ally affects academic achievement at Jazan University in the Kingdom of Saudi Arabia. As the number of e-Learning environments grows, it's critical to understand the limits that come with them in terms of usability, user interface, and user experience. There is very little doubt that these limitations have an influence on the learning experience of students. Because Blackboard Ally is growing increasingly popular, we need to evaluate its usability and user experience. This study indicated that the Blackboard Ally software makes it easy to access and use to deliver course content materials, track the performance, and grade the members of faculty appropriately. Administrators, faculty members, and students are agreed that the most helpful areas of the Blackboard Ally include ease of access to teaching and learning materials, easy file management approaches, real-time access to learning materials, and immediate feedback on the online quizzes. On the other hand, the study to evaluate the responses on the barriers to the adoption and use of the software for course materials showed that most of those teachers and faculty staff members were those who had little or no prior experience with the software. The results support the hypothesis that the Blackboard Ally is easy to access and use. This research also assists teachers in prioritizing content issues that may be changed with little remediation, cutting down on the time it takes to improve course accessibility. The possibility of quickly and considerably boosting our ability to distribute accessible information to students is what excites us the most about Blackboard Ally.

More research on administrative and policy problems, such as technical support, expenses, upgradability, permissions and authorizations, and campus upkeep, is proposed. According to the advice, teacher training sessions on Blackboard Ally should focus on how the programs aim to improve student's academic success and achieve the expected learning outcomes. Higher education administrators should prioritize hiring new faculty members who are familiar with the Learning Management System and other teaching and learning technologies, such as Blackboard Ally.

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