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Response and satisfaction level of students with virtual learning using “The Blackboard” during COVID-19 epidemic

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Background: Virtual learning is commonly used in multiple institutions worldwide. Blackboard, a course management system, is an integrated user-machine system to support the e-learning process. **Objective:** This study aimed to examine students' satisfaction level with virtual learning using the Blackboard learning system during COVID-19 epidemic. **Methods:** This descriptive cross-sectional study used a quantitative survey among undergraduate nursing students from one private college ($n = 120$) and one governmental college of nursing ($n = 106$). **Results:** The students reported an overall satisfaction level of 66% with the use of the Blackboard system. Students from families with very good incomes reported a higher satisfaction level ($F = 2.422$; $p = 0.01$). Furthermore, previous exposure to Blackboard through either teaching or training was significantly associated with students' satisfaction level ($t = 1.856$; $p = 0.04$). Additionally, good English proficiency correlated highly with students' satisfaction level ($F = 5.415$; $p = 0.002$). No difference was observed between the type of institution and the overall satisfaction level with the use of Blackboard. **Conclusion:** Students' satisfaction level with the use of Blackboard as a learning method during the COVID-19 epidemic was overall very good across academic institutions.

Keywords: COVID-19; private colleges; nursing students; governmental universities; Blackboard

INTRODUCTION

In today's digital era, knowledge acquisition has become highly dependent on the availability of various technologies (Radha et al. 2020). The COVID-19 lockdown caused an interruption in the education system on a massive scale. According to a statistical report by UNICEF, nearly 90% of the global student population had to face an interruption in education due to the pandemic. Such a halt to education was unusual and experienced globally for the first time (Bozkurt et al. 2020). Subsequently, an emergency remote mode of education using different delivery modes was employed to guarantee the continuity of education (Pérez-Villalobos et al. 2021). A sudden shift occurred from an offline classroom-based education system to a complete online education system due to stringent lockdown imposed to prevent the spread of COVID-19 (Maqsood et al. 2021). E-learning, online learning, or virtual learning are the various names used to describe the current system of education, where traditional classroom teaching has shifted to teaching using online platforms (Dhawan, 2020).

The curricula, style and art of lecture delivery, and

assessment techniques in the traditional education system were carefully designed and planned after several years of research and hard work. Any system needs careful planning before its implementation, and the same applies to online/virtual learning. Appropriate instructional design and robust educational policies are needed to make a successful teaching-learning pedagogy. Generally, transitioning from a traditional face-to-face course to an online course takes 6–9 months for proper planning, design, and implementation (Iglesias-Pradas et al. 2021). However, during the COVID-19 outbreak, in most cases, such appropriate design processes and policies were either absent or partially applied due to the sudden shift to emergency remote teaching. This showed the flaws and weaknesses of emergency remote education and its inability to cater to certain needs of the student community. This sudden shift was considered disastrous, stressful, disruptive, aggressive, and unwelcome (Rapanta et al. 2021). Emergency remote teaching was not only about online teaching during the COVID pandemic but also about the additional resources, infrastructure, and system support that must

be provided to the students to enhance learning outcomes and satisfaction (Ferri et al. 2020). On March 9, 2020, the Ministry of Education (MOE) of Saudi Arabia shut down all educational institutions to prevent the spread of the COVID-19 pandemic (MOE, 2020). This forced the faculty and the students to adapt to this drastic new change and get involved in online teaching strategies to accomplish the rest of the pending semester online. This process was under scrutiny by the officials of MOE to ensure uninterrupted and smooth education (Bamoallem & Altarteer, 2021).

Several universities and higher educational institutions in Saudi Arabia used Blackboard learning systems before the pandemic as a mode of communication between instructors and students. With the support of the higher authorities in Saudi Arabia, educational institutions swiftly transitioned from offline to online learning. Teachers and students found that the transition was sudden and difficult and had to embrace it as a part of the emergency remote teaching process. The faculty was provided sufficient training by the educational institutions and was appropriately guided by the MOE. Furthermore, the kingdom provided an official online platform for primary schools called "Madrasati," which garnered worldwide acclaim. The new teaching mode included various resources, diverse tools, organizational support, assessment techniques, roles, and organizational arrangements. Among the various technological support systems used to deliver course contents, a learning management system (LMS) has been widely used. LMS has taken a stride in recent times and has been considered the best support system for the delivery of course content by higher educational institutions (Alturki & Aldraiweesh, 2021). LMS includes several online platforms like Zoom, MS Teams, Google Classroom, and official platforms like Blackboard (Mishra et al. 2020). Blackboard, developed by Blackboard Inc., is software hosting promising features for virtual learning and course management. It is designed to sync with student information systems. It facilitates combining online and on-campus components and uses the pedagogy of hybrid or blended teaching modules tailored to benefit various prerequisites needed by the students (Lapitan et al. 2021). It has certain commendable features such as announcements, course portfolio, grade center, assessment, discussion groups, and assignments with a feature to check plagiarism using Turnitin, and above all, it has a virtual classroom, which provides the students with a real teaching-like environment, enhancing the learning-teaching process (Almekhlafy, 2020). Self-learning can be inculcated in students by the proficient use of Blackboard LMS. Furthermore, the students will become more self-reliant and gain knowledge about critical thinking, problem-solving, and troubleshooting. However, several obstacles to this emergency remote teaching have been encountered, including technical glitches, connectivity

issues, availability of the appropriate device, ambiance, surroundings, and, above all, cognitive and anxiety issues surrounding the impact of COVID-19 among families.

Several studies have focused on the academic performance of students and its relation to learning style. Acceptance of any change in a system can be measured by knowing the perceptions and attitudes of the individuals involved in the transition (Elzainy et al. 2020).

In Saudi Arabia, several studies were conducted to assess students' perceptions, satisfaction and attitudes as well as challenges encountered with the use of e-learning in general during the Covid-19 pandemic in governmental universities (Almekhlafy, 2020; Almelhi, 2021; Almusharraf & Khahro, 2020; Alowedi, 2020; Dahmash, 2020; Elzainy et al. 2020). These studies reported students' satisfaction and a positive attitude with the use of e-learning process. Whereas further studies showed that students were usually unsatisfied with the use of e-learning process in Saudi Arabia (Al-Jarf, 2020; Al-Nofaie, 2020; Mahyoob, 2020). Therefore, it is essential and imperative to evaluate the students' perceptions and satisfaction toward the current emergency mode of online teaching system and in particular by using Blackboard LMS to improvise the emergency remote teaching or to permanently transition to a blended/online learning-teaching system and uncover the ideology of students about which teaching pedagogy is the best. Additionally, it is crucial to assess student's satisfaction using assessment techniques to identify the obstacles faced by students and the stakeholders of current learning pedagogy (Gopal et al. 2021). This would help all those involved in the usage of LMS in the education system to thrive toward its improvisation, progression, and effectiveness, with the continuation and dispersion of this mode in the current pandemic situation.

The aim of this study was to examine students' satisfaction level with virtual learning with the Blackboard learning system among private and governmental institutions in Saudi Arabia by identifying the factors affecting students' satisfaction toward the use of an LMS (Blackboard) as a mode of teaching in different academic institutions during the pandemic period of COVID-19.

MATERIALS AND METHODS

Design

This was a quantitative study using a descriptive cross-sectional design.

Sample

The study included nursing students in different academic years, including 2nd, 3rd, and 4th nursing students, recruited from a governmental accredited institution and a private medical applied science

accredited college. The sample size was calculated using the Raosoft power analysis program with a 95% confidence interval and a margin of error (degree of accuracy) of 0.05%. The required sample size was 231 participants.

Instrument

The survey instrument used in this study was developed by researchers and validated to measure students' satisfaction levels with the use of Blackboard. The tool comprised two parts. The first part was about demographic information such as age, gender, nationality, family monthly income, student's status, previous exposure to Blackboard or other online platforms, English proficiency. Part two included 31 questions divided into eight subscales (4 questions on learning materials, 5 questions on learning about Blackboard, 5 questions on technical issues, 3 questions on learning experience, 3 questions on students' engagement, 2 questions on faculty performance and availability, 3 questions on academic load, and 6 questions on evaluation methods). The answer options were based on a 5-point Likert scale ranging from 1 to 5, with 1 indicating "strongly disagree" and 5 indicating "strongly agree." Higher scores mean greater satisfaction. The reliability of the tool was measured using Cronbach's alpha, and the results revealed 0.895.

Data Collection

Data were collected through an online survey questionnaire completed by nursing students in different academic years for a period of three months from November 2020 to January 2022.

Data Analysis

Descriptive statistics were presented as numbers, percentages, and mean \pm standard deviation, whenever appropriate. Between-group comparisons were performed using the Mann–Whitney U or Kruskal–Wallis tests. Normality distribution was performed using the Kolmogorov–Smirnov or Shapiro–Wilk test. The data followed an abnormal distribution, so non-parametric tests were applied. A correlation procedure was performed to determine the linear agreement between satisfaction scores and domains. Data analyses were performed using Statistical Packages for Software Sciences, version 21 (IBM Corporation, Armonk, NY, USA). A p -value <0.05 was considered statistically significant.

Ethical Consideration

The Ethical approval was obtained from the Ethical Review Board (Institutional Review Board –NO RES-2020-0071). All the information regarding the study was provided within the cover page of the questionnaire such as the study aim, the significance of the study as well as the right to refuse to participate. There was no harm on

the study participants. Moreover, the participation in the study implies consent. Confidentiality was maintained as the survey questionnaire was anonymous.

RESULTS

A total of 226 nursing students with a response rate of 98% were included in this study to evaluate their satisfaction with virtual learning. Table 1 shows the sociodemographic characteristics of the students. The most common age group was 21–23 years (61.9%). Nearly all students were Saudi (94.7%). A total of 79.2% of study participants were females, and 20.8% were males. Regarding their family monthly income, nearly one-third of them (32.3%) showed that their family earned 15,000–20,000 SAR. Furthermore, more than half of them (53.1%) were full-time students. The proportion of students who had used Blackboard or other online platforms was 69.5%. Conversely, more than half of the students were in a private college (53.1%), and the rest were in a government college (46.9%). Additionally, 68.6% of the students reported that their English proficiency was very good, and others reported that it was weak (16.8%) or excellent (14.6%).

Table 1: Socio-demographic characteristics of students ($n = 226$)

Study variables	n (%)
Age group	
18–20 years	60 (26.5%)
21–23 years	140 (61.9%)
24–25 years	16 (07.1%)
>25 years	10 (04.4%)
Gender	
Male	47 (20.8%)
Female	179 (79.2%)
Nationality	
Saudi	214 (94.7%)
Non-Saudi	12 (05.3%)
Family monthly income (SAR)	
<5,000	42 (18.6%)
5,000–10,000	61 (27.0%)
10,001–15,000	50 (22.1%)
15,001–20,000	73 (32.3%)
Student status	
Educational for employment scholarship	71 (31.4%)
Out of pocket	18 (08.0%)
Full-time student	120 (53.1%)
Others	17 (07.5%)
Previous exposure to Blackboard or other online platforms	
Yes	157 (69.5%)
No	69 (30.5%)
Type of institution	
Private college	120 (53.1%)
Government college	106 (46.9%)

English proficiency	
Excellent	33 (14.6%)
Very good	155 (68.6%)
Weak	38 (16.8%)

Table 2 shows the assessment of students' satisfaction with virtual learning. The results showed that the students agreed with nearly all statements, except

the statements "Technical support is available all the time; (2.96)" "Discussions are encouraged more than usual by the teacher on Blackboard; (3.00)" "The number of homework and assignments is acceptable; (2.90)" and "Allocated time for exams is sufficient; (2.96)" where the students rated them as neutral. The overall perceived rating for satisfaction was 3.30 (agree).

Table 2: Assessment of students' satisfaction with virtual learning (n = 226)

Statement	Weighted Mean	Verbal Interpretation
Learning materials	3.50	Agree
Course contents are constantly available on the system	3.51	Agree
Course contents are easy to understand	3.34	Agree
Additional materials, such as links, videos, and images, are available	3.51	Agree
Lectures are recorded to listen to them at any time	3.65	Agree
Learning about Blackboard	3.44	Agree
In-campus training and workshops were given before using Blackboard	3.12	Agree
Videos about how to use Blackboard are available and accessible	3.35	Agree
Videos about how to use Blackboard are easy to follow	3.47	Agree
Using the features of Blackboard is easy	3.52	Agree
The language used in Blackboard is clear and easy	3.77	Agree
Technical issues	3.28	Agree
Technical support is available all the time	2.96	Neutral
Uploaded materials, such as presentations, videos, and images, are visible	3.60	Agree
Internet connection is good enough to log in and stay online	3.04	Agree
Audiovisual quality is good	3.29	Agree
Notifications' language and statements are clear and easy	3.51	Agree
Learning experience	3.06	Agree
Using Blackboard as a learning tool was efficient	3.19	Agree
Blackboard allows for independent learning	3.34	Agree
Blackboard improved my academic performance	3.07	Agree
Students engagement	3.20	Agree
Discussions are encouraged more than usual by the teacher on Blackboard	3.00	Neutral
Blackboard enhances engagement and communication with peers and teachers	3.04	Agree
Students feel more confident to engage in discussion through Blackboard than in traditional classrooms	3.14	Agree
Faculty performance and availability	3.32	Agree
Faculty is knowledgeable about the features of Blackboard	3.27	Agree
Subjects' faculty are available for advice and support	3.38	Agree
Academic load	3.27	Agree
More time for studying is needed than in traditional classrooms	3.46	Agree
The number of homework and assignments is acceptable	2.90	Neutral
My family and leisure time are affected by the course load	3.46	Agree
Evaluation methods	3.23	Agree
The teacher uses a variety of evaluation methods	3.21	Agree
Evaluation methods are familiar and effective	3.27	Agree
Evaluation methods are explained by the faculty	3.35	Agree
Evaluation and assessment frequencies are within a normal range	3.21	Agree
Conducting the courses' quizzes and exams on Blackboard is effective	3.37	Agree
Allocated time for exams is sufficient	2.96	Neutral
Total satisfaction score	3.30	Agree

5-point Likert scale responses: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Table 3 shows the correlation between total satisfaction and its domains. A positively highly statistically significant correlation was observed between total satisfaction and its domains ($p < 0.001$). This result suggested that the increase in the score of each domain will increase the score of other domains and the total

satisfaction score. For instance, the increase in the score of the learning materials domain will increase the score of learning about Blackboard, technical issues, learning experience, student engagement, faculty performance and availability, academic load, evaluation method, and total satisfaction.

When measuring the difference in the mean score of satisfaction in relation to the socio-demographic characteristics of the students (Table 4), it was found that those who had a family monthly income of 15,000–20,000 SAR had significantly better satisfaction scores than the other groups ($F = 2.422$; $p = 0.044$).

Table 3: Correlation (Pearson's r) between satisfaction score and its domain ($n = 226$)

SN	Domains	I	II	III	IV	V	VI	VII	VIII	IX
I	Learning materials	1								
II	Learning about Blackboard	0.808**	1							
III	Technical issues	0.756**	0.774**	1						
IV	Learning experience	0.677**	0.674**	0.694**	1					
V	Student engagement	0.595**	0.587**	0.654**	0.754**	1				
VI	Faculty performance and availability	0.747**	0.728**	0.777**	0.716**	0.674**	1			
VII	Academic load	0.462**	0.491**	0.490**	0.410**	0.416**	0.472**	1		
VIII	Evaluation method	0.702**	0.689**	0.718**	0.718**	0.744**	0.769**	0.532**	1	
IX	Total satisfaction	0.867**	0.876**	0.839**	0.839**	0.805**	0.869**	0.612**	0.896**	1

** Significant correlation at the 0.01 level (2-tailed).

Table 4: Statistical difference between the total satisfaction score and sociodemographic characteristics of the students ($n = 226$)

Factor	Satisfaction Total Score (5) Mean \pm SD	F/t -test	p -value
Age group^a			
18–20 years	3.32 \pm 0.76	$F = 0.271$	0.949
21–23 years	3.29 \pm 0.79		
24–25 years	3.19 \pm 1.08		
>25 years	3.47 \pm 0.59		
Gender^b			
Male	3.24 \pm 0.89	$t = -0.534$	0.686
Female	3.31 \pm 0.77		
Nationality^b			
Saudi	3.28 \pm 0.80	$t = -1.735$	0.097
Non-Saudi	3.69 \pm 0.66		
Family monthly income (SAR)^a			
<5,000	3.08 \pm 0.91	$F = 2.422$	0.44
5,000–10,000	3.21 \pm 0.79		
10,001–15,000	3.33 \pm 0.65		
15,001–20,000	3.47 \pm 0.79		
Student status^a			
Educational for employment scholarship	3.26 \pm 0.87	$F = 1.062$	0.222
Out of pocket	3.16 \pm 0.72		
Full-time student	3.29 \pm 0.79		
Others	3.61 \pm 0.55		
Previous exposure to Blackboard or other online platforms^b			
Yes	3.36 \pm 0.80	$t = 1.856$	0.040**
No	3.15 \pm 0.77		
Type of institution^b			
Private college	3.25 \pm 0.88	$t = -0.914$	0.481
Government college	3.35 \pm 0.69		
English proficiency^a			
Excellent	2.90 \pm 0.71	$F = 5.415$	0.002**
Very good	3.34 \pm 0.79		
Weak	3.47 \pm 0.81		

^a p -value was calculated using the Kruskal–Wallis test.

^b p -value was calculated using the Mann–Whitney U test.

** Significant at $p < 0.05$.

Furthermore, those who had previous exposure to Blackboard or other online platforms had significantly

better satisfaction scores than those who did not exposed to Blackboard ($t = 1.856$; $p = 0.040$). Likewise,

weak English proficiency was significantly associated with higher satisfaction scores ($F = 5.415$; $p = 0.002$). However, the satisfaction scores of the other sociodemographic variables, such as age group, gender, nationality, student status, and type of institution, were not significantly different among the groups ($p > 0.05$).

The results showed that government college was more associated with higher satisfaction ratings related to the statements "Course contents are constantly available on the system" ($p = 0.001$), "Course contents are easy to understand" ($p = 0.006$), "The language used in Blackboard is clear and easy" ($p = 0.005$), "Notifications' language and statements are clear and

easy" ($p = 0.044$), "My family and leisure time are affected by the course load" ($p = 0.014$), and "Conducting the courses' quizzes and exams on a blackboard are effective" ($p = 0.025$), whereas private college was more associated with higher satisfaction ratings related to the statement "Lectures are recorded to listen to them at any time" ($p = 0.041$) and "The number of homework and assignments is acceptable" ($p = 0.004$). However, all domains of students' satisfaction and the total satisfaction score were not significantly different between private and government colleges ($p > 0.05$) (Table 5).

Table 5: Assessment of students' satisfaction with virtual learning between government and private colleges ($n = 226$)

Statement	Private Mean \pm SD	Government Mean \pm SD	p-value [§]
Learning materials	3.41 \pm 0.98	3.60 \pm 0.86	0.123
Course contents are constantly available on the system	3.26 \pm 1.14	3.75 \pm 0.96	0.001**
Course contents are easy to understand	3.14 \pm 1.20	3.56 \pm 1.01	0.006**
Additional materials, such as links, videos, and images, are available	3.41 \pm 1.21	3.62 \pm 1.06	0.159
Lectures are recorded to listen to them at any time	3.81 \pm 1.19	3.48 \pm 1.19	0.041**
Learning about Blackboard	3.34 \pm 1.02	3.57 \pm 0.88	0.078
In-campus training and workshops were given before using Blackboard	3.11 \pm 1.23	3.13 \pm 1.07	0.878
Videos about how to use Blackboard are available and accessible	3.27 \pm 1.24	3.45 \pm 1.20	0.255
Videos about how to use Blackboard are easy to follow	3.38 \pm 1.23	3.58 \pm 1.10	0.201
Using the features of Blackboard is easy	3.38 \pm 1.25	3.68 \pm 1.08	0.060
The language used in Blackboard is clear and easy	3.57 \pm 1.16	3.99 \pm 1.06	0.005**
Technical issues	3.26 \pm 0.96	3.30 \pm 0.84	0.729
Technical support is available all the time	2.98 \pm 1.25	2.95 \pm 1.06	0.886
Uploaded materials, such as presentations, videos, and images, are visible	3.49 \pm 1.14	3.72 \pm 1.07	0.129
Internet connection is good enough to log in and stay online	3.08 \pm 1.21	2.98 \pm 1.15	0.517
Audiovisual quality is good	3.37 \pm 1.15	3.20 \pm 1.07	0.258
Notifications' language and statements are clear and easy	3.38 \pm 1.03	3.66 \pm 1.02	0.044**
Learning experience	3.14 \pm 1.08	3.27 \pm 1.04	0.364
Using Blackboard as a learning tool was efficient	3.20 \pm 1.21	3.19 \pm 1.27	0.945
Blackboard allows for independent learning	3.24 \pm 1.23	3.45 \pm 1.11	0.180
Blackboard improved my academic performance	2.98 \pm 1.25	3.17 \pm 1.22	0.259
Students engagement	3.08 \pm 1.09	3.03 \pm 1.05	0.748
Discussions are encouraged more than usual by the teacher on Blackboard	3.02 \pm 1.28	2.97 \pm 1.22	0.788
Blackboard enhances engagement and communication with peers and teachers	3.07 \pm 1.15	3.01 \pm 1.21	0.716
Students feel more confident to engage in discussion through Blackboard than in traditional classrooms	3.16 \pm 1.22	3.12 \pm 1.30	0.832
Faculty performance and availability	3.25 \pm 1.10	3.41 \pm 0.95	0.233
Faculty is knowledgeable about the features of Blackboard	3.18 \pm 1.17	3.36 \pm 1.05	0.241
Subjects' faculty are available for advice and support	3.31 \pm 1.19	3.46 \pm 1.07	0.311
Academic load	3.26 \pm 0.94	3.29 \pm 0.64	0.754
More time for studying is needed than in traditional classrooms	3.37 \pm 1.36	3.56 \pm 1.19	0.269
The number of homework and assignments is acceptable	3.12 \pm 1.15	2.66 \pm 1.23	0.004**
My family and leisure time are affected by the course load	3.29 \pm 1.10	3.66 \pm 1.13	0.014**
Evaluation methods	3.21 \pm 0.96	3.25 \pm 0.88	0.741
The teacher uses a variety of evaluation methods	3.18 \pm 1.22	3.25 \pm 1.06	0.603
Evaluation methods are familiar and effective	3.34 \pm 1.13	3.18 \pm 1.04	0.263
Evaluation methods are explained by the faculty	3.28 \pm 1.17	3.42 \pm 0.99	0.367
Evaluation and assessment frequencies are within a normal range	3.20 \pm 1.17	3.22 \pm 0.99	0.907
Conducting the courses' quizzes and exams on Blackboard is effective	3.19 \pm 1.24	3.57 \pm 1.25	0.025**
Allocated time for exams is sufficient	3.06 \pm 1.26	2.85 \pm 1.16	0.197
Total satisfaction score	3.26 \pm 0.88	3.35 \pm 0.69	0.361

5-point Likert scale responses: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

[§] p-value was calculated using an independent sample t-test.

** Significant at $p < 0.05$.

DISCUSSION

This study evaluated students' satisfaction while

using Blackboard as a learning system, which is a method of virtual teaching that was applied due to the COVID-19 pandemic. This study included students from

governmental and private colleges to examine the implementation of virtual learning using LMS. The developed instrument was tested and validated before distribution (Cronbach's alpha 0.895).

The study results indicated that families with better incomes were able to provide better Internet connection and better computer devices for their children, which contributed to higher satisfaction levels. These results are consistent with those reported by Yardi & Bruckman (2012), which showed that family economic status impacted families' ability to have certain styles of technology (Yardi & Bruckman, 2012). Students exposed to the Blackboard platform and its features were more satisfied than those trying to learn how to use the platform. Furthermore, a previous study has shown that students' dissatisfaction with online learning was because of their English learning performance (Mahyoob, 2020). In contrast, this study showed that students with very good English proficiency were more satisfied because the language and instructions of the system were easy and clear to follow.

In this study, the overall satisfaction levels of the students with the use of Blackboard were between good and high. These findings are consistent with those by Lengetti et al. (2021), who reported that students reported higher satisfaction with online learning. In this study, students were satisfied with the virtual learning because lectures were recorded so that they could listen to them at any time, and the course contents were available on the system and accessible at any time. More importantly, students reported that faculty availability at any time for students' advice and support made them more satisfied with virtual learning. Furthermore, students reported that the language used in Blackboard was clear and easy, and videos about how to use Blackboard were easy to follow, especially for students with very good English proficiency. Interestingly, students feel more confident to engage in discussion in online teaching than in traditional classrooms.

Regarding the learning experience, the students reported that using Blackboard impacted their academic performance and that the learning tool was inefficient. This finding was inconsistent with a previous study, which showed a significant positive relationship between online learning modules and academic achievement and high marks (Goode et al. 2022). However, this study emphasized that students who could access online modules achieved higher grades than those with low access. Additionally, regarding technical issues in the Blackboard platform, the students reported that the unavailability of technical support and bad Internet connection that prevented them from logging in and staying online for a long period of time impacted their experience. This finding is consistent with that of a previous study, which showed that students who reported low satisfaction with online learning methods

were those who faced Internet issues (Karim & Hasan, 2020). Also, the online platform impacted the communication and discussion between students and faculty and between students and peers.

A previous study showed that students spend more time and effort to provide self-learning (Biwer et al. 2021). This finding is consistent with our study, which showed that Blackboard encouraged the students to learn the material independently, so they needed more time to study materials than in traditional classrooms, which affected the students' family and leisure time. Particularly, the number of assignments and homework increased based on the MOE recommendations to redistribute the marks and reduce the final exam marks.

Students in the governmental institution reported more satisfaction with the course content's availability and ease of understanding and reported that the system language and instructions were easy and clear. Furthermore, they were more satisfied with using online examinations to save more time answering questions rather than filling out bubble answer sheets, which are considered time-consuming. However, students in private institutions reported higher satisfaction levels regarding the availability of lecture recordings on the system at any time and the acceptable number of homework and assignments than students in other institutions. However, no difference was observed between the type of institution and the overall satisfaction level with the use of Blackboard. These findings may be influenced by the authorities' announcements and guidelines to follow consistently across academic institutions.

Future researchers who want to conduct a similar type of research should include a larger number of students from various institutions and, more importantly, measure the sustainability of using the platform, especially after the pandemic period has passed and now results of that period will appear.

CONCLUSIONS

This study examines students' satisfaction levels with the use of Blackboard as a learning method during the COVID-19 epidemic. The Blackboard platform proved to be a very good method of learning, although it was introduced and implemented in a very short time. Although there were some flaws in the system and its implementation without preparation, it was a rapid solution to be adopted during the pandemic and curfew situation in the country. This technique helped the students to promote independent learning and boost their confidence to participate and engage in the class.

Author contributions

Aljohani, W., and Yaseen, M. Conceptualization, Formal analysis, Methodology, Writing original draft, and Writing—review, editing and submitting the paper to the journal were done by all authors. Authors have read and

agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was approved by the Ethical Review Board (Institutional Review Board –NO RES-2020-0071).

Informed Consent Statement

Implied consent was used by answering the questionnaire.

Data Availability Statement

All of the data is included in the article/ Supplementary Material.

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Conflict of interest

The authors declare no conflict of interest

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