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Research Paper

Factors Affecting Students' Participation in Learning Management Systems (LMS): A Mixed Research Method

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Abstract. The objective of the current research is to shed light on the factors effecting students' participation in using Learning Management System (LMS) at Al-Balqa Applied University (BAU). Moreover, the study also revealed the attitudes of University students towards LMS and its usefulness. The study recruited 450 students of Al-Balqa Applied University and employed mixed research methods; a survey and semi-structured interviews to collect the data. The results of the study highlighted that the students are not satisfied with the current state of LMS due to its limited functionality, poor usability, and lack of tech-support. The research showed that University students need better learning tools that would satisfy their academic needs. Universities have to finally embrace technological innovations and refine LMSs by increasing its usability and accessibility.

Keywords: Barriers, computer efficiency, innovations, learning management system.

INTRODUCTION

Learning Management Systems (LMS) can be defined as the software application that automates processes concerning administration, management, tracking, and reporting of the training events (Kate, 2021). The simplest forms of LMS are the storage of learning materials that the students can access any time any day. More complex LMS includes some additional features, like tests and quizzes, audio or video files, interactive forums, electronic books and articles, advance search in the library. In some cases, the teacher might choose to alter the access options to different students, courses, and classes. For example, LMS might include an option allowing the teacher to combine and store materials for specific classes and courses and granting access to them according to their participation in the classes. In order to be effective, LMS has to include the possibilities for the students to provide feedback and customize their assignments and learning opportunities. LMS has multiple advantages for students, such as the possibility to save time and resources by being able to access materials anytime anyplace (Sohrabi *et al.*, 2019).

This system allows organizing materials properly and logically by using a spiral learning approach. LMS simplifies access to the materials, their archiving, and searching. Educators receive the opportunity to maximize their efforts and save time (Alenezi, 2018). Advanced LMS help teachers to monitor students' success and progress. Students can easily access the materials, use necessary books and articles, and participate in tests, quizzes and evaluations. At the same time, LMS might have certain drawbacks, including the requirement of technical, expertise during the installation, additional expense for maintenance and assistance at the first stages of integration of LMS. Students and educators might resist the implementation of LMS, as it usually requires a learning curve, adjustments of the learning processes, and change in classroom routine (Patel *et al*., 2017).

In some instances, students are not satisfied with LMS due to its technical imperfections, lack of engagement in

the learning process, and uninteresting activities. In many cases, LMS might work as the classroom (or several) that operate during and after the lessons, which would allow students to access learning materials or conduct a literature search after the lessons. In modern reality, it is more likely that LMS could be accessed through any means of interactive communication including cellphones, laptops, tablets, and home PCs of the students if the school provides this form of distance access. While this is not the form of a flipped classroom, LMS might act as such by providing the students with the possibility to learn outside the classroom in comfortable conditions (Ortiz and Green, 2019). However, not all schools have the possibility to provide all students with equal access to computers. Also, not all of them agree to provide access to the materials from home.

As a result, even if the school has LMS, it is possible that not all students can use it properly. LMS is an essential tool for the universities, as it allows saving physical space, provide the students with a variety of learning possibilities, and make the process of learning more ergonomic (Widyanti *et al.*, 2020). Simultaneously, the universities have to be aware of the potential barriers to the implementation of LMS and its effective use by students and teachers. Such aspects as proper software and hardware, timely updates, good Wi-Fi signal, and effective infrastructure have to be taken into account. In order to successfully implement LMS at educational level it is very important to evaluate the need and requirements of students in order to remove all the barriers that the universities are facing towards successful implementation of LMS. The study fills this gap by conducting a research to find out the attitudes of students towards LMS and its usefulness as well as to identify the potential barriers in the application of LMS.

Study objectives

The main objective of the current research is to shed light factors effecting Students' participation in using LMS at the Al-Balqa Applied University (BAU) specifically, the study aims at revealing the attitudes of university students towards LMS and its usefulness. Also, the barriers to implementation and the use of LMS have to be determined too.

Research questions

Based on the stated objectives, this research attempted to answer the following questions:

1. What are the students' attitudes towards the current state of LMS?
2. Is there a relation between the students' computer proficiency and their attitude towards the current LMS?
3. What are the most common barriers preventing the use of LMS?
4. Is there a relation between the students' computer proficiency level and their attitude towards the current LMS?
5. Question 5: What are the most common barriers preventing the students use of the current LMS at BAU?

METHODOLOGY

Research design

The study employs both qualitative and quantitative approaches. Qualitative design is used by the researcher for determining why LMS is or is not effective at BAU. It has been critical to find out if the students use LMS and what concerns they have regarding this system (Sohrabi *et al.*, 2019). Quantitative research design is equally important, as the study had to reveal the barriers, opinions, and use of LMS in the sample university. Therefore, the combination of the two designs is equally beneficial for the current research.

Sample and sampling techniques

Both quantitative and qualitative studies were conducted among Al-Balqa Applied University students. The recommended sample size was 377; therefore the researcher approached 500 participants out of which 450 along with their consent completed the survey with a 95% confidence level and 5% margin of error. The procedure of recruitment included obtaining the permission from university to engage its students. The semi-structured interviews, on the other hand, included five students from the same group. The respondents were selected randomly by recruiting first five respondents who agreed to take part in the interview.

Instrument for data collection

Quantitative data was collected by developing an original survey that included 15 items for the main questioning and four additional questions had to determine the rate of LMS use and some biographic data (e.g., frequency of LMS use, age, and gender). The questionnaire was rated according to the 5-point Likert scale ("strongly disagree" – 1; "disagree" – 2; "undecided" – 3; "agree" – 4; "strongly agree" – 5) (Appendix I).

Qualitative data was collected by using semi-structured interviews. The questions were developed prior to interview sessions; yet, some additional ones were added if participants raised an interesting topic. This is one of the benefits of semi-structured interviews, as they allow using flexible protocol and helping the researcher to

explore the topic in details. Prior to the interviews, the participants and the researcher scheduled time and date when the sessions were to be organized. The interviews were conducted via Microsoft Teams application. The interviews were recorded, after taking the permission of the participants, and transcribed for the convenience reasons. Each session lasted for about 20 to 30 min. The questionnaire had 8 items and several additional questions if the student touched an interesting topic (Appendix II).

Data analysis

Quantitative data was analyzed by using SPSS. The main focus of the analysis was the descriptive statistics and correlational tools. The researcher analyzed the data by measuring each question in order to determine the point of views of the students. Qualitative data was analyzed with the help of manual coding. After the transcription of the interviews, the researcher selected the most recurring themes that were combined in separate subtopics (codes). After the analysis of the interviews, the transcriptions and the raw data were deleted.

Validity and reliability

The study recruited a large number of participants to make sure that the results would be generalizable. In order to prevent bias among the participants, the researcher used randomization. Yet still, some homogeneity of the sample was preserved by ensuring that the sample had almost an equal number of males and females. Since the study used a new quantitative instrument, it was reviewed by a group of experts prior to its use to ensure its internal validity. Several items in the instrument were altered as a reaction to the professional review. Reliability of the scale was ensured by calculating Cronbach's alpha (0.948).

LITERATURE REVIEW

LMS might vary from one university to another, yet still, the system has certain features that remain universal to all higher educational institutions. Sinclair and Aho (2018) stated that LMS is widely used in higher education and it offers a gateway to innovation, technology-enhanced learning and teaching. But many university staff members still choose not to opt for it and do not explore the creative function of LMS. Alenezi (2018) conducted an assessment of LMS in a university in Saudi Arabia and determined several major barriers for its use and implementation, including poor technical support, no training for LMS, resistance to new technology, and negative attitude towards technologies. Contrado (2016) claimed that the main barrier to the use of LMS was the absence of mobile access and the possibility to use this resource at a convenient time and in comfort.

Lack of awareness, poor programs and infrastructure can also create major barriers for the students to successfully use LMS in a University (Patel *et al*., 2017). The success of LMS in university depends on factors related to the behavioral attitudes of students and professors, institutional support and the utilization of proper software (Fındık-Coşkunçay *et al*., 2019; Muries *et al.*, 2017). Nurakun, Ismailova and Dündar (2018) found that there were 3 points such as: problem with student's perception of online courses, lack of e-teaching experience among the instructors and administrative issues. Moreover, their study proposed a model which suggested that students must be shown the potential advantage of LMS usage. In addition, strong maintenance of LMS is also needed in order to be successful.

Yakubu (2019) admitted that the acceptance of LMS as a new technology depends on its relevance to the students, as many of them tend to use technological support at home and after school. According to Ugwoke *et al.* (2018), in poor countries, the success of LMS depends on financial support and the accessibility of the technologies.

Other scholars believe that LMS is completely worthless for students, as it can only serve administrative purposes rather than the educational ones (Ismaili, 2020; Al Madhoun, 2020). Yen *et al.* (2015) believe that LMS is useful only to teachers, as it allows monitoring students' progress. Seppala (2021) compared several sets of LMS and implied that this technology could be effective for students if institutions adopt several new features to the system, including mobility and ergonomics. Their study also advocated for using game-based activities in LMS to increase the interest of students in this learning system. Sanga (2016) emphasized that LMS has multiple possibilities for institutions, as it is flexible and contains several educational means. Fearnley and Amora (2020) claimed that students would use LMS only if their attitude towards this technology would comply with their behavior to utilize it. Chikurunhe (2017) admitted that students tend to avoid using LMS due to the fear to make a mistake or due to poor knowledge of this technology. Hadullo, Oboko and Omwenga (2017) claimed that LMS is more effective in developing countries due to its innovativeness and variability. Son *et al.* (2016) showed that LMS has to provide the chance for students to leave the feedback to the materials to ensure the quality of the system.

Dias *et al.* (2020) admitted that LMS could even support the creative skills of students by proposing assignments that would develop this quality. A study conducted by Juarez *et al.* (2020) found that LMS can be a great alternative to face-to-face classes through free

Table 1. Biographic information of the respondents.

Age bracket	Gender (n) %	Number of participants	Percentage	Digital proficiency (%)
18-20 years	Male (220) (49)	284	63	Beginner (8)
21-25 years	Female (230) (51)	139	31	Intermediate (65)
25 years above		27	6	Advanced (27)

Table 2. Students' attitude towards LMS.

Attitudes	Mean (M)	Standard deviation (S.D)
I am completely satisfied with the current state of LMS in my University	2.1	1.04
LMS in my University does not provide required support for my academic needs	4.21	1.04
I would like the current LMS in my University to be changed	4.4	1.02

Table 3. Students suggested improvements.

Suggested Improvements	Mean (M)	Standard deviation (S.D.)
I would prefer LMS to be more user friendly.	4.07	1.25
I would prefer LMS to have a better remote access to the systems	4.8	0.92
I would prefer the University would provide more computers or laptops for accessing LMS in the campus	4.01	1.28
I would prefer that the University provide a training course before the students are allowed to use LMS.	3.87	1.27

Table 4. Students LMS frequency of use.

Frequency of use	Mean (M)	Standard deviation (S.D.)
I use LMS very often after the lessons	3.34	0.89
I usually use LMS in the University	2.71	1.33
I use LMS very rarely and only when the teacher demands me to	3.35	0.90
Overall Frequency of use	3.13	1.04

virtual classes when the schools and universities activities have ceased because of the state of emergency such as the one prompted by COVID-19. Macnaughton *et al.* (2015) revealed that security is one of the main issues when creating effective LMS.

RESULTS

Table 1 shows that majority of the participants were among the younger age group (18-20), and 49% (220) were males and 51% (230) were females. In context to digital proficiency, majority of them were at intermediate level (65%), 27% were at advanced level and only 8% were at beginner level.

In order to answer the first research question, descriptive statistics were used to tackle the three categories in the first part of the survey.

Question 1: What are the students' attitudes towards the current state of LMS?

Table 2 reveals that the participants show a low degree of satisfaction concerning the university LMS (M = 2.1; S.D. = 1.02). The statistics provided for the second category "LMS in my university does not provide the required support for my academic needs" illustrates one of the reasons behind this low satisfaction (M = 4.21; S.D. 1.04) that makes the students strongly wanting the current LMS at their university to be changed (M = 4.4: S.D.=1.02)

Question 2: What improvements do students recommend in order to improve the current state of LMS?

The statistics in Table 3 are meant to answer this question. Participants recommended making the current LMS more user friendly (M = 4.07; S.D. = 1.27). They also want to have a remote access to the systems of LMS (M = 4.8; SD = 0.92). The participants admitted that university has to provide them with more laptops or PCs to access the materials (M = 4.01; SD = 1.28). The need for training on how to use the LMS is also underlined

Table 5. Relationship between students' computer proficiency and their attitude towards LMS.

	Beginner	Intermediate	Advanced
Mean	4.271	3.973	2.065
Standard Deviation	0.6437	0.8363	0.9273
Count	230	176	44

Table 6. Descriptive statistics of barriers preventing the use of LMS.

Barriers	Mean (M)	Standard deviation (S.D.)
Lack of technical support from University	3.94	1.41
Lack of training on LMS	3.87	1.27
Poor software and programming of the LMS	4.71	1.24
Lack of proper infrastructure for LMS	4.04	1.01
Unappealing and boring activities provided by professors on LMS	4.21	1.27

(M = 3.87; S.D. = 1.27).

Question 3: How often do the students use the current LMS?

Table 4 shows that the sample participants use LMS sporadically (M = 3.13; SD = 1.04). They report a moderate use of this system after lessons (M = 3.34; S.D. = 0.89), but it is clear that the university does not provide enough PCs causing a low use of the LMS at the university campus (M = 2.71; S.D. = 1.33). The participants also report a moderate use of the LMS even when they are recommended to do so by their teachers (M = 3.35; S.D = 0.90). The qualitative data in section 4 provides clarifications and enough explanation for these tables.

Question 4: Is there a relation between the students' computer proficiency level and their attitude towards the current LMS?

The correlation between the participants' computer proficiency level and importance of L1 in EFL classroom is shown in Table 5. According to this figure, beginners and students with intermediate level of computer proficiency tend to use LMS more often compared to those students with advanced level. It is possible that the rate of use of LMS is correlated with the time the students need to access, understand, and complete the assignments or find necessary materials.

Question 5: What are the most common barriers preventing the students use of the current LMS at BAU?

According to the data provided in Table 6, the main barrier for implementation and use of LMS is "Poor software and programming of the LMS" (M = 4.71; S.D = 1.24). The participants face many problems while using the LMS. These problems are better stated in the interviews available in the next section (section 4). The "Unappealing and boring activities provided by professors on LMS" is rated high by the sample participants (M = 4.21; S.D. = 1.27). This highlights the fact that the teaching staff should be provided with enough training to achieve a maximum effectiveness in this respect. "Lack of proper infrastructure" is rated third as an obstacle (M = 4.04; S.D = 1.01). The participants also demonstrated that the "Lack of technical support from university" (M = 3.94; S.D = 1.41) stands as an obstacle that needs further consideration. An obstacle of almost equal importance is "Lack of training on LMS" (M = 3.87; SD = 1.27).

Qualitative study

As Table 7 shows, the majority of the interviewees emphasized the negative aspects of using LMS at BAU. They claimed that their teachers or technical support is virtually absent when students require help with LMS or they are too busy with addressing the current technical bugs. All students agreed that many teachers are not aware of how to use LMS properly or how to assist students with the simplest features of this system. As a result, the students feel left alone with their problems, as they cannot access needed materials when their professors require it. All interviewees agreed that LMS needs to be advanced, include new features, and innovations in order to serve the same purpose.

According to Table 8, interviewees were selected among the students of advanced, intermediate, or beginner level. It was critical to consider the proportions of the level of proficiency among the interviewees in order to reflect the same proportions of the students recruited for the quantitative sample.

DISCUSSION

The current study aimed at determining the efficacy of the

Table 7. Representation of the coded information.

Code	Description	Examples
Improper and unequal access to LMS	The majority of participants claimed that University has limited number of computers and places where students can access to LMS	"I tried to access the materials from LMS several times during one week and failed because there were a lot of students" (B); "I usually have to run after the lesson to be able to access the computer" (E).
Ergonomics	Students agreed that LMS saves time and resources, yet, they were concerned regarding the accessibility of LMS	"I can find info faster through LMS, of course if I am able to access the PC" (C); "I would want to access all of these materials through my cellphone, I do not know what is the big deal" (A).
Better design and software	Interviewees claimed that the current LMS is obsolete and the system has frequent errors and lags.	"I remember when during one of the most important assignment all of my progress simply disappeared because of one error" (E); "It was difficult for me to access some of the features because I am not familiar with this version of the software, my home laptop has the new design and software" (B)
Training and support	Some students agreed that at least some support or assistance is critical during the use of LMS	"I usually need help when I use LMS but I can only ask fellow students to assist, as the technical support is inaccessible" (E); "I do not need help now, but I remember that I required the assistance when LMS was introduced" (B).
Interactive features	Students proposed adding interactive features to LMS by providing the possibility to interact with each other and teachers	"A forum is a good idea or maybe a minimalistic chat for peer help" (C); "I think I would want LMS has an opportunity to access the educators or, at least, some instructors for academic help" (A).

Table 8. Biographic data of the respondents.

Participant	Age	Gender	Level of digital proficiency
A	20	Female	Advanced
B	21	Male	Intermediate
C	18	Male	Intermediate
D	22	Female	Advanced
E	21	Female	Beginner

current LMS at Al-Balqa Applied University from the students' point of view, as well as the improvements they suggest. Students using LMS require adequate access to the materials stored within the system. The access to the system is poor, and participants admit their inability to receive information when they need it due to the low number of the computers provided in the university campus, not to forget the obsolete software that wastes the users' time and effort.

These concerns communicated by the participants in the current research support the results produced by Alenezi (2018). Specifically, the findings of the present study emphasized the problems of LMS with technical support and training which is in line with the findings of Contrado (2016), which states that the main barrier to the use of LMS was the absence of mobile access and the possibility to use this resource at a convenient time and in comfort. The study also found that the program infrastructure was poor; there was little or no institutional support and lack of proper software. This finding is also supported by Patel *et al.* (2017) as their study found that lack of awareness, poor programs and infrastructure can also create major barriers for the students to successfully use LMS in a University poor program infrastructure

This finding of the study is also supported by Fındık-Coşkunçay *et al.* (2019) and Muries and Masele (2017), and they state that low satisfaction of the technologies among the students and instructors can also be a barrier towards successful implementation of LMS. Other findings of previous inquiries were either partially supported or were not supported at all. The study did not support the idea of LMS as a worthless program (Ismaili, 2020; Al Madhoun, 2020), or the idea that LMS is only useful to educators (Yen *et al*., 2015). The study only partially supported the conclusion drawn by Fearnley and Amora (2020) implying that the success of LMS depends

on behavioral patterns of students.

The present research admitted that students are eager to use LMS for their academic needs and this finding is supported by ta study conducted by Widyanti *et al.* (2020), proving that it is the technological aspect of this program that has faulty functionality. The statement made by Chikurunhe (2017) who claimed that students are afraid of technologies, was not supported by the findings of the current study. The vast majority of students have intermediate or advanced digital competency, which allows them using LMS easily if it is functional. Overall, it is critical to note that since LMSs vary across different universities and countries, their comparison requires more detailed and thorough investigation. The above finding of the study is not supported by the findings of the study conducted by Hadullo *et al.* (2017) as they claim that LMS is more effective in developing countries due to its innovativeness and variability.

CONCLUSION

Overall, the students have to be able to access effective LMS that has all necessary features, from interactive communication to distance access. Universities have to realize that technological advancement is a fast process that requires constant attention. Modern students know how to use technologies and they require more usable, ergonomic, and accessible approach in LMS. The present research showed that University students need better learning tools that would satisfy their academic needs.

RECOMMENDATIONS

Universities are recommended to establish joint ventures with companies and firms from the private sector to provide students with cell phones, laptops, efficient internet connection and provide freshmen with sufficient training along with 24-hour tech-support. They should provide enough PCs in the university campus other than those in the computer labs, since these labs are almost always occupied. Moreover, they should also provide the academic staff with enough training to maximize the efficiency of such emerging systems.

Study limitation

The study was not able to involve the administrative and academic staff to evaluate their perception about the benefits and drawbacks of LMS.

Suggestions for future research

Future researches should focus on conducting more qualitative researches that involves administrative and academic staff as well as investigate available technologies for bringing improvisation in the current LMSs.

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Appendix I: Survey Questionnaire

Part I: Biographic Information

1. Please, state your gender: male female
2. Please, state your age:
3. Please, state your level of computer proficiency: beginner intermediate advanced
4. How often do you use LMS: once a day, once a week, once a month, when I need to

Part II: Opinions, Use, and Barriers to LMS Implementation

State your opinion of the statements by evaluating them according to the following scale:
"Strongly disagree", "disagree", "undecided", "agree", "strongly agree"

1- I am completely satisfied with the current state of LMS in my University.
2- LMS in my University does not provide required support for my academic needs.
3- I would like the current LMS in my University to be changed.
4- I would prefer LMS to be more user friendly.
5- I would prefer LMS to have a better remote access to the systems
6- I would prefer the university would provide more computers or laptops for accessing LMS
7- I would prefer that the University provide a training course before the students are allowed to use LMS.
8- I use LMS very often after the lessons.
9- I usually use LMS in the University.
10- I use LMS very rarely and only when the teacher demands me to.
11- Lack of technical support from University
12- Lack of training on LMS
13- Poor software and programming of the LMS
14- Lack of proper infrastructure for LMS
15- Unappealing and boring activities provided by professors on LMS

Appendix II: Questions for Semi-Structured Interviews

1. Please, state your age, gender, and level of computer proficiency.
2. What is your opinion on the current state of LMS in your University? Please, explain.
3. What have to be changed in LMS? Why?
4. When do you usually use LMS (if you do)? Please, describe the learning situations that require you to use LMS.
5. What training on LMS did you receive prior to using (if any)? I you did not, what training would you like to receive?
6. What benefits do you see in the current use of LMS?
7. How your teachers help you to use LMS?
8. What new advancements would you implement in the current LMS?