Learning Management System Now and in The Future: Study Case from the Indonesian University Students

H. Fibriasari, W. Andayani*, T. T. A. Putri, and N. Harianja

***Abstract*—The need to study during the pandemic drove students of all grade levels to pursue online education. Some Indonesian schools and colleges developed the LMS platform to facilitate online learning. LMS (Learning Management Systems) is a novel concept for the majority of pupils. This study explored the experiences and expectations of students using LMS at an Indonesian government university. This is a qualitative study comprised of interviews. Twenty university students were recruited for interviews. The interview findings were then coded to identify major themes. The interview showed three primary themes: the benefits of employing an LMS, the difficulties of utilizing an LMS, and the future of LMS. The majority of students enjoyed using the LMS during their studies and encountered no operational difficulties. However, the biggest difficulty is the pupils' poor internet connection, as they access the Internet from their rural homes. The findings suggested that in the future, following the COVID-19 pandemic, LMS could serve as a replacement for the traditional learning process, since many students have realized its benefits.**

***Index Terms*—E-learning, LMS, students' experiences, technology, university students.**

I. Introduction

The pandemic of COVID-19 has had numerous implications on education. Due to the closing of institutions and schools, teachers and students must quickly adjust to distance education. Throughout teacher education preparation, the responsibility to create learning environments for student instructors necessitated decisions, choices, and adaptations to meet not only student expectations, but also teacher education requirements and the operating conditions of colleges and schools [1].

Face-to-face education has been replaced by online education. This event also transpired in Indonesia. Numerous colleges have created their own Learning Management Systems (LMS) for the management of online education. A Learning Management System (LMS) is web-based software used to manage and monitor online education. It contains tools for sharing online courses and collaborating on them. In higher education, the use of LMSs to supplement face-to-face training has become increasingly widespread in recent years [2]-[4]. The adoption of LMSs by academic institutions has facilitated the delivery of higher-quality, learner-centered education. LMSs have the ability to provide distinctive learning and teaching methods that address a variety of educational needs.

Both educators and students play crucial roles in these systems. Educators can use this software to track the progress of their students, while students can log in to submit assignments, download course materials, and view their grades. They are able to connect with others, take responsibility for their own learning, develop critical thinking skills, and make friendships with other pupils [5], [6]. These technologies allow students and teachers to learn at their own pace and in any location [7]-[9].

Few research have determined that student perceptions of LMS features are connected. While some authors claim that students have a more positive attitude toward technology than employees [10], it may be "overly simplistic to characterize professionals as reluctant to adopt new technologies and younger pupils as more likely to embrace them" [11]. In addition, students have voiced appreciation for the LMS's ease of access to course materials and features that enable connection with other course participants [12]-[19]. Heirdsfield *et al.* [12] found that instructors were less enthusiastic about the interactive components of LMSs than students [14]. Others who have investigated this topic have suggested that employees view the interactive components of the LMS as too time-consuming [15].

In Indonesia, a similar occurrence took place. Due to the government's policy of allowing students to study at home, schools and universities have been pressured to replace face-to-face learning with online learning. Some universities in Indonesia have created a learning management system to facilitate online training for students. Thus, this study investigated the learning experiences of university students using a Learning Management System (LMS). Twenty students were surveyed to determine the learning utility of this LMS. This study also analyzed the obstacles students face when accessing the LMS. Following a pandemic, the outcomes of the study will be used to enhance the LMS and the continuous learning that results from it.

II. Literature Review

A. Online Learning during Pandemic

The irregular closures of schools and colleges as a result of COVID-19 can have a variety of negative effects on education and raise grave concerns [16]-[18]. Given the severity of the problem, a lack of technological access and the digital divide can deprive students of educational possibilities [19]. It is frightening to consider that nearly 21 million Americans, or 6.5% of the population, including up to 12 million school-aged children, lack access to high-speed Internet [16], [20]. Despite the significance and relevance of these data, the United States' lack of access pales in compared to the global scenario. As of 2019, more than 45 percent of global

Manuscript received November 18, 2021; revised April 24, 2022; accepted June 20, 2022.

H. Fibriasari, W. Andayani, T. T. A. Putri, and N. Harianja are with the Universitas Negeri Medan, Medan, Sumatera Utara, Indonesia.

*Correspondence: widyaandayani@unimed.ac.id

doi: 10.18178/ijiet.2023.13.1.1791

households lacked internet connection, suggesting that pupils in other nations may face even more dire educational outcomes. During this epidemic, technological limitations such as a lack of equipment and a consistent internet connection were crucial for low-income households [21].

There are several crucial factors that contribute to the success and efficiency of online learning. Student motivation is necessary for academic success and effective learning, whether online and in-person. Opportunities for social interaction with classmates and teachers are crucial for student learning in an online environment [22]. The community can be fostered through collaborative learning activities and ongoing verbal interaction [23]. However, one of the most significant issues identified was encouraging students [21]. Earlier research has demonstrated that common concerns about online learning, such as a lack of face-to-face interaction, a lack of knowledge and access to technology, decreased student motivation, an increased emphasis on grade administration, and an increase in workload, can be addressed through proper instructor practice and training [24]. Moreover, instructor preparation for teaching in an online setting, successful course design, direct instruction, and the development of self-regulation skills among learners are elements that contribute to the quality and success of distance and online learning [25]. Unfortunately, the rapid and widespread adoption of ERT allowed little time for the development of high-quality online learning courses.

Educators were obliged, regardless of prior online teaching expertise, to learn how to teach online and adapt to online learning within a limited and often unreasonable timeframe [26]. Due to the fact that teachers' in-person teaching skills and course topics cannot be transferred directly to the virtual environment, they must develop a new and broader skill set through ERT [27]. Because teachers' digital competencies for utilizing ERT may differ [28], student learning may be negatively impacted. Despite the fact that many schools and teachers were unprepared for this online change, a number of institutions lowered the workload, abolished assignments and exams, and provided a pass/fail grading option to reduce student stress [26].

B. *The Use of LMS*

A learning management system (LMS) is "a computer software or web-based technology used to design, implement, and assess a particular learning process." [29]. Also known as Electronic Learning Management Systems (ELMS), Course Management Systems (CMS), content management systems (content management systems), and learning content management systems (LCMS). In general, LMSs facilitate content sharing and online interactions between instructors and students. LMSs are classified as Knowledge Management Systems (KMSs), and they serve two primary market areas. Initially, colleges and universities implement educational learning management systems (LMSs). Their primary goal is to simplify the process of producing and delivering in-class or online courses by facilitating the exchange of content, assignments, online quizzes, wikis, online forums, and chats based on user roles [30]. Additionally, the participation of the student in online activities can be monitored (Sullivan, 2008). Figure 1 presents a list of typical LMS attributes. Corporate learning management systems, which are widely deployed by businesses to promote the production, sharing, acquisition, and retention of organizational knowledge, constitute a second rapidly expanding market. Corporate LMSs grew in popularity for training and work standardization as managers realized that organizational learning might help organizations increase their competitiveness by acquiring certain abilities.

Since the mid-1990s, the LMS industry has flourished, becoming one of the most promising global marketplaces for information technology solutions. It is anticipated to increase from $2.55 billion in 2013 to $7.83 billion in 2018 at a CAGR of 25.2% [31]. The educational LMS market is smaller than the corporate LMS market, although it is expanding. It supports all educational levels, from universities to elementary and secondary schools. 92 percent of educational institutions in the United States support a single campus-wide LMS, and around 55 percent of all classes use the system in some manner [32]. Similar to other types of software, LMSs can be commercial systems with closed structures and a fee for use. Alternately, they could be open source systems that make software openly downloadable and modifiable. Blackboard (or Blackboard Learn) and Desire2Learn are the most popular proprietary LMSs in education, whereas the most popular open-source LMSs are Moodle, Sakai, and Canvas.

In recent years, chalk, blackboards, and overhead projectors have been replaced by learning management systems as the primary tools available for university-level instruction (LMS). LMSs are widely utilized in both on-campus and online higher education nowadays. They are widely characterized as information systems that assist e-learning by enabling teaching and learning, as well as administrative tasks and instructor-student contact [33]. However, research on the impact of its use on higher education teaching methodologies is still in its infancy [34], [35]. In addition, LMS frameworks have been criticized for being overly instructor-centric, as they appear to be created only to aid instructors in handling student assignments and feedback, resource distribution, and different administrative duties [36], [37]. Recently, learning management systems (LMSs) have been including interactive features like as blogs, wikis, chat rooms, and discussion boards; characteristics that, in contrast to classic transmission models, have the potential to support constructivist learning approaches [38]. Rubin *et al.* [39] state that a good LMS "must encourage active participation, meaningful links between course segments, ease of communication, and formative feedback on work presented in class discussions or other contexts." Faculty and students must see the value in participating in these collaborative components in order for this type of interaction to occur and for LMSs to be used for reasons other than information conveyance.

III. Method

This qualitative study collected data through interviews. This interview study utilized Ma's [40] sociocultural framework to investigate the students' LMS experiences during the epidemic. Kvale [41] proposed that it is easier for

the researcher to unearth the activities, experiences, and opinions of the participants by interviewing them in their native language. Since the students were accustomed to studying face-to-face, their experiences with LMS were novel and distinct. The semi-structured interview served as a guide to obtain further information regarding the participants' backgrounds, learning experiences, cultural and psychological factors.

A. Participant

Ten male and ten female students were recruited for this study, for a total of twenty participants. They were selected based on their age and participation in online learning activities.

Participants are students from one Indonesian university, Universitas Negeri Medan. They are students enrolled in the Art and Language Faculty who study English and French. With the professors' approval, the announcement regarding participant recruitment for this study was distributed via WhatsApp. Since the authors are also their instructors, permission is easier to obtain. Their ages ranged between 19 and 22 years old. The demographics of the participants are shown in Table I.

TABLE I: PARTICIPANT DEMODRAPHY

Participant	Gender	Age	Department	Semester
	Male	20	English	4th
P2	Male	20	English	4th
P3	Male	21	France	6th
P4	Male	21	France	6th
P5	Male	20	English	4th
P6	Male	22	English	6th
P7	Male	22	France	6th
P8	Male	22	France	6th
P9	Male	20	France	4th
P10	Male	20	English	4th
P11	Female	19	France	2nd
P12	Female	19	English	2nd
P13	Female	21	France	4th
P14	Female	20	English	4th
P15	Female	20	English	4th
P16	Female	22	English	6th
P17	Female	21	France	6th
P18	Female	20	English	4th
P19	Female	20	France	4th
P20	Female	22	France	6th

The majority of the research participants lived outside of Medan, where the university is located. They previously rented a room or a house close to the campus. However, since the outbreak, the students have returned to their hometowns to complete their online coursework.

Before beginning the study, the authors asked the participants to fill out a consent form indicating their willingness to participate. The authors described the objectives of the study, the research methodology, and the potential risks that could occur [42]. The students then agreed to participate in a series of interviews, the results of which constitute the participants' life data. The authors utilize pseudonyms rather than the complete names of the participants to protect their privacy [43].

B. Research Procedure

The methods for acquiring the data were carried out in stages. First, the authors outlined the objectives of the study and solicited the students' participation. After participants agreed to participate in this study, a Google form survey was distributed to them. The poll consisted of questions regarding the respondents' educational background and LMS learning experiences throughout the pandemic. After completing the Google form-based written interview, the next step was scheduling the online interview.

The online interview was scheduled based on the participants' availability. The interview was conducted via Whatsapp and Zoom video calls. The interview was taped for the study of the application. Each interview lasted twenty to thirty minutes. The interview data was listened to multiple times before being written down or transcribed into tables to facilitate identification and classification. The interview was conducted in Indonesian Bahasa.

C. Data Collection

There were two methods employed for data collection. The first method is a written interview using a Google form, and the second method is a virtual interview via Whatsapp video chat and Zoom. The semi-structured virtual interview investigated the participants' experiences and expectations regarding the use of LMS during online learning. The interview topics included the benefits of utilizing LMS, the challenges they encountered while learning using LMS, and their future expectations for the LMS.

During the interview, the participants answered the questions without hesitation. Because the author and interviewer had previously developed a tight relationship. The author and participants have the relationship of instructor and pupil. They frequently discussed topics outside of academics. Thus, the author could investigate more participant information.

Following participant interviews, the next stage was data analysis. However, prior to data analysis, the authors provided the participants opportunity to review the interview data (member checking). This measure was taken to increase the data's credibility and maintain the integrity of data reconstruction [44].

D. Data Analysis

Using thematic content analysis, the data collected were analyzed [45]. This theme analysis was conducted to gain a better understanding of "what has been told" rather than the story's structure. In addition, it was utilized to identify difficulties and experiences based on particular themes. The analysis centered on repeatedly reading the interview transcript to comprehend the meaning and story discourse. The transcript was then coded based on the themes, subthemes, and any other potential themes that emerged.

The acquired data were then coded and categorized (see Table II). The data were then evaluated using critical discourse analysis to determine the correct interpretation of each participant's utterance. The goal of this approach was to investigate the meaning inherent in data as empirical text [46], [47]. In addition, Halliday [48] underlined that a phenomenon can be translated through meaning, word order, and

experience within a particular social and situational context. The data in this study contain social functions that cannot be isolated from their social and cultural contexts.

TABEL II: THE EXAMPLE FOR ANALYSING DATA THEMATICALLY

Interview data	Coding	Theme
P2	Getting closer with LMS, I found that this application helped me to simplify my learning (learning is easier) because the features are very complete. Just one click (effective), I can get material, submit my assignment, and do my exam.	Advantages of using LMS
P12	Nothing is bad.. The only problem is the connection in my place (connection problem). Sometime my network is very low. I can access the LMS.	Challenges in using LMS
P8	After the pandemic, LMS can be an alternative for studying. Just add one more feature for chatting and discussion. (add the feature)	LMS in the future

The purpose of the focus group discussion was to learn more about the participants' difficulties with utilizing LMS. Five male and five female students alone were recruited for the focus group discussion. In July and August of 2021, the focus group discussion was held twice. Since the participants were still studying online, it was conducted through zoom meeting. The first meeting highlighted the students' LMS utilization experiences. The second meeting addressed the challenges encountered during the learning process and how to improve it in the future.

IV. RESULT

After analyzing the participant interviews and focus group discussion data, three significant themes became apparent. The first theme is the benefits of adopting LMS in the classroom. The second subject is the challenges they face when implementing LMS, and the final theme is their hopes for the future of LMS.

A. The Advantages of Using LMS in Learning

When asked if the LMS software is beneficial to the studies of participants, the vast majority (90 percent) responded affirmatively. When asked to list the benefits of the learning tool, participants mentioned a variety of factors, including convenient access to results and information, studying materials/resources, enhanced and effective online communications, and explanations of challenging lesson material with their instructors. Information sharing, involvement in group discussions, research, and on-the-go learning via technology such as forums were cited as benefits. This is referred to as "smart learning" since it attempts to provide prospective university students with instruction immediately, saving them time and supporting them in strengthening their digital literacy skills.

Participants also highlighted the benefits of utilizing the LMS software, such as easy access to learning resources (90%) and online assignments (85%). Some participants additionally highlighted the benefits of the LMS software in the following suitable ways:

Even if it was challenging to use at first due to my lack of experience. At first, I still study how to operate it and I don't get used to it. But later when I use it more often, it is very easy to operate it. '(p. 1).

'It allows me to communicate with other students. I use the LMS software to get my course materials, and I use this learning platform to write my interim assessments. The LMS provide a room to chitchat, so we still can discuss informal things besides our lessons.' (p. 2).

'I use the LMS to acquire information from lecturers, as well as participate in group discussions. The LMS also give us space to make discussion with friends and lecturers. So this is more interesting. The lecturer is also very welcome to our questions and ready to answer at any time .the time is also flexible. The assignment deadline can be 24 hours. ' (p. 3).

'I have learned how to obtain information from learning devices such as resources and assignment tools. Indeed, learning on the LMS software has grown more fascinating. the more I explore this LMS, the more I know that this software is really great. This LMS can be used at any time and any place. ' (p. 4)

Participants in focus group talks realized that if students have access to the internet and a reliable connection, they can download course materials, information, assignments, and deadlines, and return completed assignments to their instructors from any location. Participants' justifications for continuing to use the LMS included key phrases such as "easy, quick, and straightforward, as well as saving time and being accessible."

B. Challenges University Students Faced Using LMS in Learning

The participants responded affirmatively when asked if they experienced any difficulties when utilizing the LMS for their studies. Frequently noted were network issues or outages, as well as late course material uploads. They allege that accessing online course materials can be challenging at times due to network failures, weak links or poor connectivity or interface, slowness, or power fluctuations.

'Nothing is difficult with this LMS besides the connection. Sometimes the connection in my place is not good. It is getting worse when it rains. I missed collecting my assignment because of the bad connection.'(p.12)

'*The most annoying is when it keeps buffering at the time I want to access the material. I can't even open it and download it.' (p.10)*

'hhhmm… I think the thing I need the most is a stable connection… this low connection can decrease my spirit of studying.'(p15)

However, they recognized that some of the problems stemmed from their end because they are too busy at work to properly participate with their lecturers online.

'well, the real problem when studying online is you have other things to do. Doing the housework seems more busy than doing homework,'(p.9)

'I couldn't more agree with him. We have a lot of work when studying from home.'(p.8)

Interactions with focus group participants found that network failures/problems/challenges (80%) were common as a result of a weak Internet connection revealed by interview participants.

'When the connection is bad, I just shut down my laptop and continue sleeping, hahahaaa…'(p.13)

'Usually I wait until the connection is better, but waiting make me dying. And after that I am lazy to open it again.'(p.18)

'well… when I can't submit the assignment on time, I will blame it to connection. That is the best reason. The lecturer will understand.'(p3)

The following are appropriate ways in which the participants expressed themselves:

'Sometimes the learning materials are late to download. We have to wait the lecturers to upload it.' (p.5)

'often, when the lecturer inform you to stay online, the connection doesn't cooperate with us. The signal then became very low .this is actually what we always experience. '(p.2)

'Network problems are far too common, especially while taking online tests and quizzes.'(p.1)

Similarly, the late posting of learning materials (65%) was discovered by interviewers. According to the focus group participants, some learning/course materials are not regularly updated to reflect the changing times, and the interface is not seamless in the sense that self-correction is not available. Consequently, once the send button is pressed, there is no opportunity for modification. I believe that this is one of the challenges that technology might provide to customers. On the other hand, it is suggested that, as experiential learners, today's students who learn via discovery would need to carefully review their work before to submitting it. This is backed by the irreversibility of communications, which cannot be restored once they have been delivered.

When asked if the stated problems had an effect on their learning, all participants agreed. In addition, they said that it occasionally affects their performance, especially when the network stalls or slows down. A participant said:

'Occasionally, I have difficulty sending a finished assignment during the meetings, it can also be tricky for me to self-correct my work after I have hit the send button' (p. 5).

'once you have click to send it, you can't fix it again..'(p.17)

'there is no feedback from my answer. It is just wrong and correct…'(p.20)

The participants in the focus group discussions primarily agreed with this assessment. The participants admitted that this difficulty, in particular, has a significant impact on their final grades. However, one would think that as social-media-savvy students, the participants would take the time to check over their completed work and make any necessary corrections before hitting the send button. However, in this situation, the contrary was observed..

C. Improving LMS for the Future Use

Participants provided a number of options for assuring the smooth operation of the LMS software, such as a stronger signal network and a reliable Internet connection.

85 percent of participants agree that a stronger signal network is required to power the LMS software. They also noted that if the system could be configured to have an easy-to-use interface, it would assist them in self-correcting errors, especially during exam sessions (90 percent). As a result, 78% of respondents recommended for enhanced system flexibility to make it easier to use. If the LMS software is made flexible, it will substantially enhance the educational endeavors of university students. In this manner, some participants emphasized the approaches to be implemented in order to boost LMS platform utilization:

'Because many students continue to utilize the same network, the system must be updated on a regular basis. I believe the system is under too much pressure, and as a result, the required arrangements must be made to improve the LMS software's usage.' (p. 5)

'Upgrade the software, provide full information and deliver alerts' (p. 9).

'Upload or submit all learning material before the semester begins. Examine and maintain the system on a regular basis between off and peak hours to avoid unexpected outages of the LMS software' (p. 10).

86 percent of respondents answered that the power supply should be reliable; therefore, the backup generator should be activated so that it can serve as an additional source of power. This method ensures that electricity to the LMS platform is always available even if the national grid fails. To facilitate the participants' learning, the system should be readily accessible to them at all times of the day and night. In order for students to fulfill deadlines and enhance their ties with their examiners and instructors, Internet access should be available to them at all times (90%). The objective is to maintain stable Internet connectivity so that the LMS can operate without interruption.

When the university implements this method, all notifications, assignments, and instructional materials will be readily accessible to students at the proper time. It is considered that university students are the key to overcoming the never-ending torrent of change, thus this strategy seems desirable. In order to give university students with the opportunity to learn using the LMS software, it is essential that the personnel, namely the technical staff in the computer laboratories, are approachable and easily accessible. This result is consistent with the concept that university students' readiness to study also depends on learning program organizers and technical personnel demonstrating empathy, respect, approachability, and honesty. This is vital, according to the researcher, because university students are a diverse group of individuals with substantial responsibilities who must be respected in order to receive their attention in learning situations.

During the focus group talks, participants reported that an improved interface of the LMS program and an increase in time from one hour to one-and-a-half hours would be beneficial for their exam performance. They indicated that this proposal is a result of the LMS software frequently freezing, allowing them to make up for time lost while waiting for the system to start or turn on.

V. Discussion

During the epidemic, interaction with participants revealed

that they are utilizing LMS systems. Participants concurred that the program was valuable and beneficial to their studies, especially in terms of easy access to learning/course materials and time savings. Nearly all of the participants (85%) answered that they will continue to use the LMS software in their academic pursuits. The perception that learning from LMS is more valuable than the time and effort required has a substantial impact on students' positive attitudes regarding LMS.

Indeed, it is unsurprising that the vast majority of respondents (90%) mentioned self-learning as the primary benefit of using an LMS platform. Currently, self-learning is actively promoted through the use of ICT-based teaching and learning tools and software, such as a learning management system (LMS). Self-learning is the means by which essential skills are learned. Students' perception that it requires a great deal of time and effort to understand the technology in order to improve their practice is a potential additional barrier. Consequently, the competencies of today's university students can be enhanced by persistent and continuous learning using the LMS software, whether in the classroom, the business, or the community.

As LMS features affect student satisfaction, the majority of prior study has focused on their effect on student communication [12], [48]-[51]. These LMS features include the sense of being unable to interact effectively with professors and students due to the LMS. Moreover, according to a study on student satisfaction with convenience, although students like the convenience of online learning, they are often dissatisfied with the quality and amount of engagement with instructors and peers in the online learning environment [52]. In this context, the efficacy of students has also been found to be crucial. Nonetheless, it has been demonstrated that students are as productive when participating in a learning experience that combines in-person and online education [53]. In addition, it has been shown that by employing a well-designed course, it is possible to compensate for the often lower levels of student satisfaction with online learning [54]. This study determined that students are able to actively engage and communicate with the instructor at any moment. In contrast, face-to-face learning limits interaction to class time, but online learning allows students to contact instructors at any time, 24 hours a day.

Even when online subjects featured interactive components, they looked to be mostly discussion boards. Despite the fact that participants perceived these as a poor substitute for face-to-face interaction due to the delayed nature of any interaction and the tendency for interactions to be limited to question and answer between students and lecturers, the results showed that they were a good alternative. In face-to-face class, students can receive immediate responses to their inquiries. Otherwise, they are need to wait for a response in online learning.

Participants learnt at their leisure, allowing them to work, study, and earn, according to the responses. Indeed, it has and feedback mechanisms, enabling students to obtain immediate feedback on completed exercises. This is an essential principle for college students, and it is vital. It may be argued that the quicker pupils receive feedback on their performance, the better and more motivated they are to work harder and improve their performance when they fall short. Ultimately, highly driven college students demonstrate more positive attitudes toward computing, feelings of competence, and enjoyment than less motivated individuals.

Lack of Internet connectivity continues to restrict university students from using learning management systems. In fact, difficulties with network connections are one of the top perceived hurdles to entering higher education as a university student. According to the participants, this is a reasonable concern. It can be difficult for participants to submit or access/receive instructional materials during network outages. Other concerns often reported by college students utilizing the LMS software were an inadequate network access (70%) and late uploading of instructional materials (30%). Participants in focus group talks reported that a number of online questions were occasionally inadequate, improperly organized, and poorly conceived.

VI. Conclusion

Despite its popularity as a vital component of infrastructure in higher education, opinions on the effectiveness of LMS in aiding student learning vary. This study examines student opinions of the primary components of a learning management system (LMS), establishing the extent to which these features are appreciated by end users and enhance student learning. The objective of this article is to investigate the LMS experiences of Indonesian university students. The primary objective of the study was to determine the benefits that university students obtained from using LMS in their studies. It also solicited university students' issues in using LMS for their studies and offered ideas that university students might utilize to improve their LMS software usage. Despite initial challenges brought on by inexperience, the findings indicate that university students use LMS software for their studies. According to them, adopting the LMS software has facilitated easier access to course/learning materials and enhanced communication with course examiners, instructors, and peers. It also facilitated autonomous study and research.

On the other side, according to the participants, using the LMS software is riddled with obstacles, such as poor and inconsistent Internet connectivity, sporadic power/electricity, and a bad LMS software interface. Before implementing the LMS, the students should receive training on how to use it, as required by the findings. In fact, regular use of the LMS software would help university students acquire digital literacy as part of their lifelong, life-wide, and life-deep learning journey. The study concludes that the current global information age, fueled by enhanced teaching and learning technology tools such as the LMS software, has made learning ubiquitous and that it can be done anywhere, at any time, and at the learner's own pace and convenience.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTIONS

H. Fibriasari conducted the research; W. Andayani conducted the research and composed the article; T. T. A. Putri and N. Harianja conducted the research and analyzed the data.

FUNDING

This study was funded by Lembaga Penelitian dan Pengabdian Masyarakat/research and community service department (LPPM) in Universitas Negeri Medan, Indonesia.

REFERENCES

[1] M. A. Flores and M. Gago, "Teacher education in times of COVID-19 pandemic in Portugal: National, institutional and pedagogical responses," *Journal of Education for Teaching, Advance Online Publication*, vol. 46, pp. 507-516, July 2020.

[2] N. Vernadakis, P. Antoniou, M. Giannousi, E. Zetou, and E. Kioumourtzoglou, "The effect of information literacy on physical education students' perception of a course management system," *Learning, Media and Technology*, vol. 36, pp. 419-435, 2011.

[3] K. A. Al-Busaidi, "An empirical investigation linking learners' adoption of blended learning to their intention of full e-learning," *Behaviour & Information Technology*, vol. 32, pp. 1168-1176, 2013.

[4] A. K. M. N. Islam, "Investigating e-learning system usage outcomes in the university context," *Computers & Education*, vol. 69, pp. 387-399, 2013.

[5] L. Y. Tay, C. P. Lim, S. Y. Lye, K. J. Ng, and S. K. Lim, "Open-source learning management system and Web 2.0 online social software applications as learning platforms for an elementary school in Singapore," *Learning, Media and Technology*, vol. 36, pp. 349-365, 2011.

[6] L. P. Macfadyen and S. Dawson, "Numbers are not enough. Why e-learning analytics failed to inform an institutional strategic plan," *Educational Technology & Society*, vo. 15, pp. 149-163, January 2012.

[7] S.-W. Chou and C.-H. Liu, "Learning effectiveness in a web-based virtual learning environment: A learner control perspective," *Journal of Computer Assisted Learning*, vol. 21, pp. 65-76, 2005.

[8] D. Kelly, J. S. Baxter, and A. Anderson, "Engaging first year students through online collaborative assessments," *Journal of Computer Assisted Learning*, vol. 26, pp. 535-548, 2010.

[9] M.-C. Hung, I.-C. Chang, and H.-G. Hwang, "Exploring academic teachers' continuance toward the Web-based learning system: The role of causal attributions," *Computers & Education*, vol. 57, pp. 1530-1543, 2011.

[10] S. Palmer and D. Holt, "Development of student and academic staff perceptions of the elements of an online learning environment over time," *Australasian Journal of Educational Technology*, vol. 30, pp. 375-389, 2014.

[11] J. Waycott, S. Bennett, G. Kennedy, B. Dalgarno, and K. Gray, "Digital divides? Student and staff perceptions of information and communication technologies," *Computers & Education*, vol. 54, pp. 1202-1211, 2010.

[12] A. Heirdsfield, S. Walker, M. Tambyah, and D. Beutel, "Blackboard as an online learning environment: What do teacher education students and staff think?" *Australian Journal of Teacher Education*, vol. 36, pp. 1-16, 2011.

[13] J. Rowley and J. O'Dea, "Enjoyment of elearning among teacher education students in Australia," *International Research in Education*, vol. 2, pp. 134-144, November 2014.

[14] N. Zanjani, S. Nykvist, and S. Geva, "Do students and lecturers actively use collaboration tools in learning management systems?" presented at the 20th International Conference on Computers in Education (ICCE 2012), National Institute of Education, Nanyang Technological University, Singapore, November 26-30, 2012.

[15] R. G. Jurado. (2009). Barriers to a wider implementation of LMS in higher education: A Swedish case study, 2006-2011. [Online]. Available: http://disde.minedu.gob.pe/handle/20.500.12799/2769

[16] N. Chavez. (March 2020). The Coronavirus pandemic could shut down schools for months, leaving some students hungry and far behind their peers. CNN. [Online]. Available: https://www.cnn.com/2020/03/16/us/impact-coronaviruslong-term-school-closures/index.html

[17] E. M. Onyema, N. C. Eucheria, F. A. Obafemi, S. Sen, F. G. Atonye, A. Sharma, and A. O. Alysayed, "Impact of Coronavirus pandemic on education," *Journal of Education and Practice*, vol. 11, no. 13, pp. 108-121, May 2020.

[18] UNESCO. (2020). Adverse consequences of school closures. [Online]. Available: https://en.unesco.org/covid19/educationresponse/consequences

[19] UNESCO. (March 2020). UNESCO rallies international organizations, civil society and private sector partners in a broad. [Online]. Available: https://en.unesco.org/news/unesco-rallies-international-organizations-civil-society-and-private-sector-partners-broad

[20] Federal Communications Commission. (May 2019). 2018 Broadband Deployment Report. [Online]. Available: https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report

[21] J. Reich *et al.*, "Remote learning guidance from state education agencies during the COVID-19 pandemic: A first look," *EdArXiv Preprints*, pp. i-17, April 2020.

[22] P. Redmond, A. Heffernan, L. Abawi, A. Brown, and R. Henderson, "An online engagement framework for higher education," *Online Learning*, vol. 22, no. 1, pp. 183-204, 2018.

[23] R. Chatterjee and A. P. Correia, "Online students' attitudes toward collaborative learning and sense of community," *American Journal of Distance Education*, vol. 34, no. 1, pp. 53-68, 2019.

[24] M. S. Andrade, "Teaching online: A theory-based approach to student success," *Journal of Education and Training Studies*, vol. 3, no. 5, pp. 1-9, 2015.

[25] A. Cherif, F. Movahedzadeh, G. Adams, M. Martyn, J. Harris, and S. Gialamas, "Faculty perspectives on narrowing the success gap between online and onsite learning," *Research Journal of Education*, vol. 5, p. 128, 2019.

[26] N. Johnson, G. Veletsianos, and J. Seaman, "U.S. faculty and administrators' experiences and approaches in the early weeks of the COVID-19 pandemic," *Online Learning*, vol. 24, no. 2, pp. 6-21, 2020.

[27] N. Peachey, "Synchronous online teaching," in *Digital Language Learning and Teaching: Research, Theory, and Practice*, M. Carrier, R. M. Damerow, and K. M. Bailey Eds., NY: Routledge, 2017, pp. 143-155.

[28] P. Sahu, "Closure of universities due to Coronavirus Disease 2019 (COVID-19): Impact on education and mental health of students and academic staff," *Cureu.*, vol. 12, no. 4, e7541, 2020.

[29] N. A. Alias and A. M. Zainuddin, "Innovation for better teaching and learning: Adopting the learning management system," *Malaysian Online Journal of Instructional Technology*, vol. 2, no. 2, pp. 27-40, 2005.

[30] Josh Bersin. (December 2020). Resetting employee trust in a post-covid world. [Online]. liablele: http://www.forbes.com/sites/joshbersin/

[31] New Market Report. (2020). [Online]. Available: http://www.marketsandmarkets.com/Market-Reports/learning-managementsystems-market-1266.html

[32] T. Means, D. Johnson, and R. Graff, *Lessons Learned from a Course Management System Review at the University of Florida*, IGI Global Publisher, 2013, pp. 55-71.

[33] J. E. Klobas and T. J. McGill, "The role of involvement in learning management system success," *Journal of Computing in Higher Education*, vol. 22, no. 2, pp. 114-134, 2010.

[34] H. Beetham and R. Sharpe, *Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning*, 2nd Ed. New York: Routledge, 2013.

[35] S. Renzi, "Differences in university teaching after learning management system adoption: an explanatory model based on Ajzen's theory of planned behavior (by Stefano Renzi with Danielle H. Lee as Coordinator)," *ACM SIGWEB Newsletter*, no. 4, pp. 1-4, 2011.

[36] J. Mott and D. Wiley, "Open for learning: The CMS and the open learning network," *In Education*, vol. 15, no. 2, pp. 1-10, 2009.

[37] D. Weaver, C. Spratt, and C. S. Nair, "Academic and student use of a learning management system: Implications for quality," *Australasian Journal of Educational Technology*, vol. 24, no. 1, pp. 30-41, 2008.

[38] S. Lonn and S. D. Teasley, "Saving time or innovating practice: Investigating perceptions and uses of learning management systems," *Computers & Education*, vol. 53, no. 3, pp. 686-694, 2009.

[39] B. Rubin, R. Fernandes, M. D. Avgerinou, and J. Moore, "The effect of learning management systems on student and faculty outcomes," *The Internet and Higher Education*, vol. 13, no. 1-2, pp. 82-83, 2010.

[40] Q. Ma, "A multi-case study of university students' language-learning experience mediated by mobile technologies: A socio-cultural

perspective," *Computer Assisted Language Learning*, vol. 30, pp. 1-21, 2017.
[41] S. Kvale, *Doing Interviews*, London: Sage, 2008.
[42] M. Hammersley and A. Traianou, *Ethics in Qualitative Research Controversies and Context*, London: Sage, 2012.
[43] H. P. Widodo, "Methodological considerations in interview data transcription," *International Journal of Innovation in English Language Teaching and Research*, vol. 3, no. 1, pp. 101-109, 2014.
[44] L. Harvey, "Beyond member – checking: A dialogic approach to the research interview," *International Journal of Research & Method in Education*, vol. 38, no. 1, pp. 23-38, May 2014.
[45] J. Fullana, M. Pallisera, J. Colomer, R. F. Pena, and M. Perez-Buriel, "Reflective learning in higher education: A qualitative study on students' perceptions," *Studies in Higher Education*, pp. 1-15, 2014.
[46] B. Setyono and H. P. Widodo, "The representation of multicultural values in the Indonesian Ministry of Education and Culture-endorsed EFL textbook: A critical discourse analysis," *Intercultural Education*, vol. 30, no. 4, pp. 383-397, 2019.
[47] H. P. Widodo, "A critical micro-semiotic analysis of values depicted in the Indonesian Ministry of National Education-endorsed secondary school English textbook," in *Situating Moral and Cultural Values in ELT Materials: The Southeast Asian context*, H. P. Widodo, L. V. Canh, M. R. G. Perfecto, and A. Buripakdi Eds., Cham, Switzerland: Springer, 2018, pp. 131-152.
[48] F. Alhosban and S. Ismaile, "Perceived promoters of and barriers to use of a learning management system in an undergraduate nursing program," *International Journal of Emerging Technologies in Learning*, vol. 13, no. 2, pp. 226-233, 2018.
[49] V. Damnjanovic, S. Jednak, and I. Mijatovic, "Factors affecting the effectiveness and use of Moodle: Students' perception," *Interactive Learning Environments*, vol. 23, pp. 496-514, 2015.
[50] M. Paechter and B. Maier, "Online or face-to-face? Students' experiences and preferences in e-learning," *The Internet and Higher Education*, vol. 13, pp. 292-297, 2010.
[51] M. T. Cole, D. J. Shelley, and L. B. Swartz, "Academic integrity and student satisfaction in an online environment," in *Cases on Online Learning Communities and Beyond: Investigations and Applications*, H. Yang and S. Wang, Eds., Hershey, PA: IGI Global, 2012, pp.1-19.
[52] J. K. Cavanaugh and S. J. Jacquemin, "A large sample comparison of grade based student learning outcomes in online vs. face-to-face courses," *Online Learning*, vol. 19, pp. 1-8, 2015.
[53] D. McFarland and D. Hamilton, "Factors affecting student performance and satisfaction: Online versus traditional course delivery," *Journal of Computer Information Systems*, vol. 46, pp. 25-32, 2005.
[54] Y. C. Kuo and B. R. Belland, "An exploratory study of adult learners' perceptions of online learning: Minority students in continuing education," *Educational Technology Research and Development*, vol. 64, pp. 661-680, 2016.

Copyright © 2023 by the authors. This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (CC BY 4.0).

Hesti Fibriasari was graduated with her S1 study from Universitas Negeri Medan majoring in French education department. Next, she continued her study to postgraduate program in Universitas Sumatera Utara majored in Linguistics. She also spent her Doctoral program in Linguistics in Universitas Sumatera Utara. She is now teaching in Universitas Negeri Medan in French Education Department. She focuses her research in teaching French language.

Widya Andayani is a lecturer in Universitas Negeri Medan in English Department, applied linguistics post graduate program, and linguistics doctoral program. She graduated her S1 in English literature in Universitas Sumatera Utara. She also graduated her post graduate and doctoral program in Universitas Sumatera Utara majored in linguistics. She is interested in doing research about gender and sexuality in education, linguistics, and literature.