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Learning Management System (LMS) In The Post-Pandemic Era: An Evaluative Review Of User Experience And Learning Outcomes

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Abstract: One of the online learning platforms that adopts a conventional learning approach but is managed online is the Learning Management System (LMS). LMS is not only easy to use but also encourages independent learning in a social environment for students, providing them with full control over their learning process. This study aims to explore the user experience of LMS post-pandemic. The method used in this study is descriptive qualitative research, which aims to uncover the facts, conditions, variables, and phenomena occurring at present. The subjects of this study are all teachers and students from high schools in the Dewantara District. The results of the study indicate that students are very enthusiastic about the learning process using the LMS application, as they find it easier to understand the material, which positively impacts their learning outcomes. Additionally, teachers show greater creativity in delivering learning materials. The use of LMS also facilitates teachers in assigning tasks to students, making the learning process more varied and no longer monotonous.

Keywords: LMS, Education, Technology; Learning, Management.

1. Introduction

The rapid advancement of time has driven technological progress in various fields, including education. Technological progress, especially in the field of education, has had a significant impact on the way knowledge is delivered. This can be seen from the increasing access to the internet, websites, and various applications that can be used to deliver learning materials and enhance the quality of education. Furthermore, we can observe how the younger generation, particularly students, have become highly tech-savvy. They are now familiar with the use of the internet and various other applications available today.

Technological advancements have made it easier for students to explore a broader range of knowledge without having to rely solely on the textbooks available in schools. Additionally, teachers are also able to more easily design and organize various learning activities that capture students' attention without depending on monotonous teaching methods. At the beginning of 2021, the number of internet users in Indonesia reached 202.6 million people. This figure represents an increase of 15.5% or approximately 27 million people compared to 2020. With Indonesia's total population currently reaching 274.9 million, it can be concluded that the internet penetration rate in Indonesia at the beginning of 2021 was 73.7% [1].

Moreover, several previous studies have shown that the use of information technology and internet-based multimedia can significantly change the way knowledge. is transferred. This technology also serves as an alternative method of learning that can be implemented in online

classrooms [2]. Currently, many schools have provided internet access to support a more effective learning process. The use of the internet has also become a bridge that enables a broader application of modern teaching methods

Currently, many schools have provided internet access to significantly support the learning process. Internet usage not only serves as a bridge between teachers and students but also facilitates both direct and indirect (online) learning activities. Chang claims that online-based media can be used not only for socializing with peers but also for studying and even learning new languages [3]. Moreover, Moore et al. found that nearly 70% of students reported enjoying online learning using platforms such as LMS, WhatsApp groups, Facebook communities, Twitter chats, and Google+ communities [4].

Looking back to 2019, the COVID-19 pandemic brought significant changes to the education system, requiring all learning activities to be conducted online. Online learning allows teaching and learning processes to occur anytime and anywhere, a concept also known as distance learning. One online learning platform that adopts conventional teaching methods but is digitally managed is the Learning Management System (LMS). According to Setiawan and Aden, LMS is not only easy to use but also promotes independent learning within a social environment and gives students greater control over their learning process [5]. LMS features make it easier for teachers to organize lessons and enable students to learn independently [6]. Research by Nortvig et al. shows that using LMS provides students with the freedom to express themselves in an unrestricted environment, allowing them to further explore their potential and skills [7].

Ellis defines a Learning Management System as a software application that automatically manages the administration, implementation, and reporting of training activities. Additionally, LMS serves various functions, including: (a) acting as an administrative center, (b) providing self-service guidance for users, (c) structuring and presenting learning content periodically, (d) utilizing web-based platforms, (e) supporting better portability and standardization, and (f) managing reusable learning content [8]. Amiroh adds that LMS is a software application used by educators in higher education and schools as an internet-based online learning medium (e-learning) [9]. Szabo describes LMS as an infrastructure capable of delivering and managing content, identifying, assessing, tracking progress, and collecting and presenting data to oversee the overall learning process [10].

Riad and El-ghareeb state that LMS is a comprehensive software that integrates features for course delivery and management, including automatic course catalog management, material delivery, and quiz handling. Darmawan outlines several LMS characteristics, including: (a) administration, (b) content delivery, (c) testing, (d) grading, and (e) communication [11a]. Additionally, Lailasari (2016) identifies several learning components within LMS, such as: (a) information, (b) materials, (c) assessments, and (d) interaction in learning [12]. This research aims to explore the user experiences of Learning Management Systems (LMS) in the post-pandemic period.

2. Materials and Methods

This study employs a qualitative descriptive method aimed at exploring the facts, conditions, variables, and phenomena occurring at present [13]. The instrument used for data collection in this study is a questionnaire, which is distributed to respondents by having them fill out the survey online via Google Forms. The subjects of this study are all teachers and students from high schools in the Dewantara District.

3. Results and Discussion

3.1. Results of the Student Survey on the Learning Management System (LMS) Response

The student survey on LMS responses includes 10 indicators with 37 statement items, where each indicator has a different number of statement items. The overall data obtained from the respondents can be seen in the table 1.

Table 1. Students' Responses to LMS Questionnaire

Indicator	Score	Average Score	Average (%)	Overall (%)
Basic ICT Skills	98	2.97	72.98	
	100	3.03		
	91	2.76		
ICT Skill Development Needs	117	3.55	71.59	
	72	2.18		
Availability of ICT Learning Media in Schools	100	3.03	50.25	
	99	3.00		
	0	0.00		
Effectiveness of ICT Learning Media	115	3.48	78.03	
	113	3.42		
	92	2.79		
	105	3.18		
	81	2.45		
	112	3.39		
Impact of ICT Learning Media	112	3.39	84.85	67.09
	113	3.42		
	111	3.36		
Barriers and Challenges of ICT Learning Media	72	2.18	62.63	
	99	3.00		
	77	2.33		
Knowledge About Learning Management System (LMS)	94	2.85	65.72	
	89	2.70		
	85	2.58		
	79	2.39		
LMS Presentation in Learning	69	2.09	53.79	
	73	2.21		
Teachers' Attitude Toward LMS Usage	86	2.61	64.02	
	83	2.52		

In the first indicator, namely basic ICT skills, there are 3 statement items which received a score of 62.55%. In general, respondents are able to master the basic skills in using ICT. In the second indicator, which is the need for ICT skill development, there are 3 statement items with a score of 67.97%. In this indicator, most students have participated in training activities to improve their ICT skills. These training activities are usually provided at school, so the students are able to use ICT, particularly in operating computers/laptops.

The third indicator, which is the availability of ICT learning media at school, contains 3 statement items that received a score of 50.70%. In this category, not all schools currently have or provide ICT-based learning media. However, schools that do provide learning media, such as computers, projectors, the internet, and others, facilitate students in recognizing various types of learning media, especially schools that already have internet access. The fourth indicator, which is the effectiveness of ICT learning media, consists of 4 statement items with a score of 79.44%. The use of ICT in the learning process significantly helps teachers in delivering various materials, making it easier for students to understand each topic being taught. Moreover, the use of ICT in learning prevents students from getting bored during lessons.

In the fifth indicator, which is the use of ICT in learning, there are 5 statement items with a score of 67.53%. This is due to the fact that the use of ICT in the learning process makes it easier for teachers to deliver materials and for students to understand the learning content. Furthermore, the integration of ICT in learning activities enables students to more easily access various materials they need. The sixth indicator, which is the impact of using ICT, includes 6 statement items that received a score of 78.28%. The use of ICT makes students more enthusiastic about learning and completing assignments given by teachers. Additionally, students find it easier to access answers to various questions that are difficult to solve. As stated by Salmiyanti, the utilization of resources and media is expected to stimulate students' thinking, feelings, interest, and attention so that the learning process can run smoothly [14]. Furthermore, the learning process becomes more effective because ICT, as a source and learning media, helps overcome communication barriers between teachers and students.

The seventh indicator, which is the obstacles and challenges of ICT learning media, consists of 4 statement items with a score of 63.67%. The obstacles frequently encountered by students include difficulties with network access when trying to access various materials and tasks. Additionally, some students still feel confused about applying ICT media in learning. The eighth indicator, which is knowledge about the Learning Management System (LMS), contains 4 statement items with a score of 58.70%. Some students find it easier to learn using LMS because the LMS application created by teachers is not only for downloading materials, but also includes other features such as assignments and submission portals. This greatly facilitates students' learning. However, learning with LMS becomes a challenge for some students, especially those who are not familiar with using IT, laptops, or computers.

The ninth indicator, which is the use of LMS in learning activities, consists of 3 statement items that received a score of 64.41%. Students are enthusiastic about learning that involves the use of LMS. The tenth indicator, which is students' attitudes toward the use of LMS, includes 4 statement items with a score of 67.58%. Students feel happy with learning that is not monotonous, especially learning that involves information technology.

3.2. Results of the Teacher Survey on the Learning Management System (LMS) Response

Based on the results of the teacher survey on LMS responses, there are 10 indicators with 28 statement items, where each indicator has a different number of statement items. The data can be seen in the Table 2.

Table 2. Teachers' Responses to LMS Questionnaire

Indicator	Score	Average Score	Average (%)	Overall (%)
Basic ICT Skills	405	2.44	62.55	66.08
	390	2.35		
	451	2.72		
ICT Skill Development Needs	532	3.20	67.97	

	440	2.65	
Availability of ICT Learning Media in Schools	382	2.30	50.70
	506	3.05	
	504	3.04	
	0	0.00	
Effectiveness of ICT Learning Media	535	3.22	79.44
	526	3.17	
	526	3.17	
	523	3.15	
ICT Usage in Learning	422	2.54	67.53
	413	2.49	
	531	3.20	
	428	2.58	
	448	2.70	
Impact of ICT Learning Media	514	3.10	78.28
	542	3.27	
	510	3.07	
	513	3.09	
Barriers and Challenges of ICT Learning Media	376	2.27	63.67
	501	3.02	
	419	2.52	
	395	2.38	
Knowledge About Learning Management System (LMS)	400	2.41	58.70
	382	2.30	
	395	2.38	
	382	2.30	
LMS Usage in Learning	404	2.43	64.41
	417	2.51	
	462	2.78	
Students' Attitude Toward LMS Usage	426	2.57	67.58
	438	2.64	
	478	2.88	
	453	2.73	

In the first indicator, which is ICT skills, a score of 72.98% was obtained. This is because, in general, many teachers are able to use or operate computers and laptops. Additionally, some teachers have already started using various learning media platforms, both online and offline.

The second indicator, which is the need for ICT skill development, received a score of 71.59%. In this indicator, most teachers expect the school to organize training activities related to ICT usage workshops. The goal is to help teachers improve their ICT skills.

In the third indicator, which is the availability of ICT learning media in schools, a score of 50.25% was obtained. This is because only some schools have provided ICT-based learning media such as computers, projectors, the internet, and others. With such facilities, the use of ICT in learning activities becomes easier. According to a study by Lestari, teachers play a major role in the sustainability of ICT-based learning. This role is supported by school principals and school committees in providing adequate facilities and infrastructure, including increasing ICT-based learning media in schools [15].

The fourth indicator, which is the effectiveness of ICT learning media, received a score of 78.03%. In this indicator, most teachers feel that the use of ICT in teaching helps them communicate more easily with students, both in delivering learning material and in assigning tasks, whether independent or project-based.

The fifth indicator, which is the impact of ICT learning media, received a score of 84.85%. In this indicator, teachers find it easier to gather various kinds of information and deliver learning materials. Furthermore, students also find it easier to understand the material presented and to find additional information.

The sixth indicator, which is the obstacles and challenges of ICT learning media, received a score of 62.63%. Some teachers still feel challenged in operating various ICT devices, especially when using laptops. Additionally, limited internet connectivity can be a barrier for teachers when accessing learning materials, online learning applications, or even just using the internet itself. This aligns with the findings of Wicaksono, who stated that several factors influence teachers' mastery of ICT, both internally and externally, such as age, interest, motivation, ICT infrastructure, the role of the government in organizing training or seminars, and the role of schools in supporting teachers' activities in their work and learning process using ICT [16]. Therefore, internal and external factors are interconnected in the teachers' mastery of ICT.

The seventh indicator, which is knowledge about the Learning Management System (LMS), received a score of 65.72%. Since COVID-19 hit Indonesia in 2019, almost all learning activities have been conducted online, which indirectly forced teachers to start using various online learning applications, especially LMS. Additionally, teachers were required to have their own LMS access to facilitate online teaching. Online learning also taught teachers to become familiar with LMS applications, how to use them, and how to assign tasks to students through the platform. This is supported by research conducted by Ni'am, which states that the utilization of information technology through electronic learning can make it easier for both students and teachers to interact and support online learning activities [17].

The eighth indicator, which is the presentation of LMS in teaching, received a score of 53.79%. In this category, some teachers still use LMS in their teaching activities, mainly for completing assignments and engaging in discussions. The ninth indicator, which concerns teachers' attitudes toward the use of LMS, received a score of 64.02%. In this indicator, teachers are very pleased with the LMS application because it makes it easier for them to deliver learning materials and assign tasks to students. This aligns with the research conducted by Anggriawan,who stated that LMS covers administration, material delivery, assessment, monitoring, and communication [18]. The materials in pedagogical and professional competencies, packaged with multimedia (text, animation, video, sound) in LMS, accelerate the mastery of knowledge and technology, which can improve the quality of learning optimally.

Post-pandemic COVID-19, school learning activities are now conducted face-to-face, and the learning process is no longer conducted online but offline. Many teachers are no longer actively using various learning applications like LMS. However, teachers still use other applications such as WhatsApp groups, Google Forms, and various multimedia tools. This is done to facilitate communication with students and to deliver assignments and learning materials.

Based on interviews with teachers and students, as well as field observations of student learning outcomes post-pandemic, there has been a change in students' learning outcomes. After the pandemic, there was a decline in student learning outcomes compared to before the COVID-19 pandemic. This is due to the fact that some students still struggle to understand the materials delivered by teachers during online/distant learning.

4. Conclusions

Based on the discussion above, it can be concluded that students already have a good understanding and mastery of ICT usage. Students also show great enthusiasm when the learning process uses the LMS application. This is because they find it easier to understand the material and can access previously learned content. Additionally, the use of ICT in learning activities has been proven to improve students' learning outcomes, as the learning process becomes more engaging and not monotonous.

Meanwhile, based on the teacher survey results, it can be concluded that the use of ICT in learning activities makes teachers more creative in delivering material. The use of LMS also helps teachers assign tasks to students more easily, thus making the learning process less monotonous. The use of various ICT applications in schools indirectly raises teachers' awareness of software and the internet, enabling them to develop creativity in teaching.

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