The Effect of Using Learning Management System Learning Media on Student Independence and Learning Outcomes

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Abstract: In the learning process, good student learning motivation is created by the use of engaging learning media. When students become motivated, it will enhance their independence in learning, which in turn will lead to better learning outcomes. This research aims to conduct a literature review to explore the influence of using Learning Management Systems (LMS) on students' independence and learning outcomes. Additionally, the study seeks to identify alternative LMS platforms besides Moodle, Edmodo, and Google Classroom, which are widely used among educators in Indonesia. The research employs the Systematic Literature Review (SLR) method, which aims to identify, assess, and interpret all evidence from previous studies to find solutions to existing problems. The data collected from this research indicate that e-learning using LMS has been proven to enhance students' academic achievement and learning independence. Apart from Edmodo, Moodle, and Google Classroom, there are many other LMS platforms that educators can explore, such as Canvas LMS, which is equally attractive as other LMS platforms

Introduction

Education is the main pillar in character building and the progress of a nation. In it, the role of teachers is crucial as the spearhead in determining the success of the learning process. Teachers are not only the conveyors of knowledge, but also the pioneers in guiding, motivating and inspiring the next generation. In an era of change and technological advancement, the role of teachers is becoming increasingly significant in producing competent and characterful leaders.

Teachers are not just figures who deliver subject matter, but also role models who shape students' characters. They have a huge responsibility to create a learning environment that is positive, inclusive and triggers the interests and potential of every student. In this context, the role of teachers is not limited to classroom teaching, but includes being facilitators, mentors and guides who support the holistic development of learners. Teachers should be able to design more effective strategies to ensure quality and relevant learning to prepare students for future challenges.

Fikri and Madona (2018) mentioned that classroom learning is declared as quality learning if the teacher can create a conducive learning environment so that all students are actively involved in the learning process. Widiaswworo (2018) in his book also mentioned that teachers are the spearhead of the success of educational goals. The task of the teacher must be able to provide a quality and relevant learning situation and learning process to students so that it can help their development more optimally.

Of course, effective and quality learning will also be able to provide meaningful learning experiences for students. This meaningful learning experience will create an interested learning activity because of the high motivation of students. Something that is fun will bring meaning to a person and easily stored in the brain. Learners can scoop up all the information as a whole so that the final consequence is to improve their learning ability (Jaya, 2021).

The learning process designed and implemented by a teacher has a main goal, which is to achieve optimal learning outcomes for students. The results of the learning process carried out by students are then referred to as learning outcomes. Learning outcomes include not only mastery of subject matter, but also skill development, attitude improvement, and character building. Teachers who successfully achieve these can be considered agents of change who make a significant contribution to the development of learners, shaping them into individuals who are ready to face challenges and make a positive impact in society.

However, in a learning process, learning outcomes are often identified as the culmination of educational efforts. However, in the reality of the classroom, there are often a number of challenges and problems that can become obstacles in achieving these goals, including student grades that do not reach the minimum completion criteria, the absence of interest and motivation to learn from students which has an impact on the level of student learning independence, students often feel bored which is caused by uninteresting teaching methods, lack of relevance of the material, or lack of participation in class activities, and many more problems that students have in their learning process.

Apart from these problems, there are other challenges from the latest independent learning curriculum owned by education in Indonesia today, namely where teachers must also pay attention to the learning needs of students in accordance with the demands of their era. As we know, the Merdeka Belajar Curriculum is the latest Indonesian curriculum developed and designed by the Ministry of Education, Culture, Research and Technology (Kemendikbudristik) to face global changes and technological developments in the era of the Industrial Revolution 4.0.

Another challenge of education in the 21st century, the era of Industrial Revolution 4.0 is the development of high-tech skills. Students must be equipped with the necessary technological skills to be able to adapt to these changes, and the Internet of Thing is a basic skill that must be mastered by students in this increasingly digitalised era. Learning that utilises internet technology is one form of the concept of learning in the era of the Industrial Revolution 4.0 as it is today (Cahya, 2023).

Looking at the problems, challenges and opportunities, the development of a learning process that uses information and communication technology, especially the internet, to provide students with access to learning materials (E-learning) is an interesting and relevant solution. The use of LMS is the best choice in providing the desired E-learning process. LMS is expected to provide a more dynamic, interactive, and customisable learning experience according to students' individual needs.

However, it should also be noted that the use of Learning Management System (LMS) in the e-learning process also has important implications for the development of learning materials. In this case, efforts to improve the quality of e-learning through LMS do not only cover the technical aspects of using the platform, but also demand attention to the development of learning content that supports modern educational goals, or what is commonly referred to as Learning Object Material. Learning object material is a learning unit that can be used independently and can be integrated into the LMS.

From this, this research was conducted to conduct a literature review with the aim of exploring whether there is an effect of using a Learning Management System on independence and learning outcomes obtained by students. This research also aims to find out what LMS platforms can be recommended for use in addition to the Moodle, Edmodo and Google Clasroom LMS platforms that are already widely used among educators in Indonesia.

Methods

The type of research used in this research is Systematic Literature Review (SLR). Systematic Literature Review research is conducted with the aim of identifying, assessing, and interpreting all evidence from previous research, so as to get answers to existing problems. Researchers collected various journals obtained from Google scholar with the keywords used to search journals, namely the effect of using learning management system learning media on student independence and learning outcomes. From this search, we obtained 10 literatures that are relevant to the study to be carried out, namely whether there is an effect of using the Learning Management System on the independence and learning outcomes obtained by students, as well as finding out what LMS platforms can be recommended for use in addition to the Moodle LMS Platform and Google Clasroom which are already widely used among educators in Indonesia.

Research Results And Discussion
Results

The use of the internet as a learning medium has become increasingly prevalent in the 21st century. This phenomenon cannot be separated from the rapid development of information and communication technology (ICT) which has changed the traditional learning paradigm. The internet provides access to abundant educational resources, opening the door for more interactive, flexible and relevant learning methods to the needs of students in this digital era. In this context, the internet provides a variety of e-learning platforms and applications that allow students to access course materials from various sources quickly and efficiently. Educational websites, e-learning platforms and other online resources give students the flexibility to learn at their own pace and learning style.

The diversity of learning media accessible through the internet is also a major attraction. Learning videos, interactive simulations, e-books and online discussions create a dynamic and engaging learning environment. In addition, collaboration between students from different regions or even countries can happen through online learning platforms, enriching their learning experience.

The use of the internet as a learning medium not only benefits students, but also provides new challenges and opportunities for educators. Teachers can utilise online resources to design more relevant and engaging lessons, as well as improve interaction in the teaching-learning process.

Overall, the increasing trend of using the internet as a learning medium in the 21st century reflects a profound transformation in educational approaches. The utilisation of the internet as a learning medium in the e-learning method opens up a number of great potentials that change the educational paradigm. By utilising the potential of the internet wisely, learning can be more inclusive, dynamic, and can prepare students to face the increasingly complex demands of the future.

According to the April 2022 digital report from Hootsuite and We Are Social, 80% of Indonesians use the internet to find information. Almost half of them, or around 44%, use the internet for learning purposes. E-learning is not only for students, but it is also available for anyone who wants to learn about a topic or field for work or to improve their skills. 40% of the world's top 500 companies also use E-learning methods in their training programmes. The use of E-learning itself has indeed increased quite rapidly, especially since the covid-19 pandemic in 2020. According to Forbes, the global E-learning market will grow to 325 billion dollars by 2025, double its growth over the past decade (Rizal, 2022).

The e-learning method is the result of the evolution of learning accelerated by high-tech advancements. One of the most striking innovations is the emergence of a learning platform known as Learning Management System (LMS). The LMS provides the foundation for the development and effective implementation of e-learning methods in various education and training contexts.

Courts and Tucker (in Simanihuruk et al, 2019) mentioned that LMS (learning management system) is an application with a learning concept that manages the learning process, provides and delivers content, and tracks online activities. The use of LMS (learning management system) in general offers information technology-based learning innovations that utilise open source applications that can be downloaded on the internet.

Based on the results of google scholar searches that researchers conducted to find out the effectiveness of e-learning by using the Learning Management System (LMS) on student learning outcomes, the following researchers present the summary results of previous journal research articles that researchers present in the form of a table below:

Table 1. Effectiveness of E-Learning Learning Using Learning Management System (LMS) on Student Learning Outcomes

No	Author	Titel	Research results
1	Yana, D., & Adam. (2019)	The Effectiveness of Using LMS Platforms as Blended Learning Media on Student Learning Outcomes	From this research, it is known that the results of the study: 1. There was an increase in student learning outcomes using Schoology based on blended learning as evidenced by the difference in the average score of students' pretest and posttest learning outcomes of 8.24. 2. 2. There was an increase in student learning outcomes using Quizlet based on blended learning, as evidenced by the difference in pretest and posttest scores of 19.96 points. 3. Increased student learning outcomes using Canvas based on blended learning which can be proven by the difference in student learning outcomes scores of 10.41.
2	Muhajir, dkk, (2019)	The Effectiveness of Using Edmodo-	From the results of this study, it is known that there is a positive increase in student learning outcomes

		Based E-Learning on Interest and Learning Outcomes (Case Study at Smk Negeri Al Mubarkeya)	by using Edmodo learning media. This can be proven by the comparison of the average post-test scores in the experimental group (X-TKJ 1) and the control group (X-TKJ 2), namely the post-test score of the experimental class getting an average score of 80.31, while the control class is getting an average score of 67.65.
3	Trisnaningsih, dkk, (2016)	Development of Learning Management System quipper School on Learning Material of the Body's Defence System to Increase Motivation and Learning Outcomes of Xi Class Students at Sma Negeri 3 Yogyakarta	From the results of the study, it is known that the use of Leraning Management System Quipper School increases student learning motivation, which this motivation also brings an increase in student learning outcomes. Based on these results, the gain score value of 0.701 is obtained, which shows that the increase in students' understanding before and after using LMS in the form of Quipper School in the learning process is in the high category.
4	Sam & Idrus, (2021)	Effectiveness of e Learning Media Based on Learning Management System (LMS) in the Era of Covid-19 Pandemic	Where in his research states that the use of LMS student learning outcomes, this can be seen from the results of the N-Gain Score test where the N-gain score is 86 which means it is in the high category (high). From these results it can be concluded that there are cognitive changes in students towards the implementation of the learning management system.
5	Juniati, dkk, (2023)	Effectiveness of Physics Learning Assisted by Google Classroom as a Learning Management System (LMS) to Improve Critical Thinking Skills of Students in Grade XI SMA Negeri 1 Karangrayung	From the results of data analysis, it shows that there is an increase in students' critical thinking skills in the experimental class compared to the control class. This is evidenced by the average value of the experimental class of 83.36 which is classified as very high, while the control class is 66.14 which is classified as moderate.
6	Danofsyah, dkk, (2022)	Effectiveness of the Moodle-Based Learning Management System (LMS) Platform at SMK Negeri 1 Rao Selatan	From this study, it is known that based on the post-test results for the experimental and control classes, the value of Wide Area Network Technology / WAN (TJBL) for the experimental class averaged 77.39 with a standard deviation (s) of 8.42 which means high. While in the control class, Wide-Based Network Technology/WAN (TJBL) averaged 67.57 with a standard deviation (s) of 7.47. In addition, from the Hypothesis Test, it is also known that the effectiveness of using the Moodle LMS on student learning outcomes is accepted.

7	Astuti dan Febrian, (2019)	Blended Learning: Effectiveness Study of E-Learning Content Development in Higher Education	Showing the results of the research is effective to improve student learning outcomes in the Kapita Selecta Mathematics course. From the results of the research conducted, it is known that the test results of class A students using E-Learning (32 students) obtained an average score of 71.9375 while the test results of class B students using conventional learning (29 students) obtained an average score of 52.07143.
8	Hakiki, dkk, (2022)	Effectiveness of E-Learning Based Digital Modules in Character Education Subjects at STKIP Muhammadiyah Muara Bungo	Shows the results where based on the results of the analysis obtained a t-count value of -15.453 with a t-table of 2.019, because t-count < t-table (-15.453 < 2.019), it is stated that there is an increase in learning outcomes between before and after applying the learning module through e-learning.
9	Maulidditya, dkk, (2020)	Learning Maths on Lms Chamilo to Increase Student Learning Independence	From the results of the study, it is known that the effectiveness of learning media based on student responses to the media obtained a percentage of 80.03% with a very good category. In addition, to see students' learning independence, an increase was obtained from 54.26% to 72.56%. Thus, the learning media developed is effectively used in learning mathematics to increase students' learning independence.
10	Widodo, (2022)	Effectiveness of Madrasah E-Learning in Distance Learning at MTSN 1 Malang City during the Covid-19 Period	From the results of the research, it was found that the use of madrasah elearning at MTsN 1 Malang City from April to August 2020 experienced many obstacles, especially the problem of internet networks in the madrasah and inadequate server capacity, which had an impact on the distance learning process which ultimately also had an impact on the quality of learning. E-learning is effectively used as distance learning during this covid period with the zoom meeting application and google classroom to overcome the weaknesses of elearning.

Discussion

Consistently, all the journal articles reviewed above highlight a significant conclusion, where the use of Learning Management System (LMS) has been proven to increase the effectiveness of student learning. The learning outcomes of students' learning independence showed a positive improvement due to the use of LMS in e-learning. These findings make an important contribution to understanding the positive impact of technology integration in the educational process, as the journals show that students who engage in learning through LMS tend to achieve higher academic attainment and there is also an increase in students' learning independence through the utilisation of LMS.

This is as stated by Herwinsyah, et al (2023) in his book, which states that in e-learning there are 2 important concepts that support the achievement of learning

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effectiveness, including the concept of independent learning and the concept of personalisation.

The concept of self-directed learning emphasises learners' ability to manage their own learning time, goals and methods. In an e-Learning environment, learners have the flexibility to set learning times that suit their personal schedules, and can access learning materials whenever they need them. They can learn independently by reading, watching videos, and carrying out learning activities that suit their individual needs. With this self-directed learning concept, learners can set their own learning pace, revise difficult material, and explore topics that interest them in more depth.

Meanwhile, the concept of personalisation explains that in E-learning, students have the ability to tailor their learning experience according to their unique needs, interests and characteristics. In the context of e-Learning, learners can access customised learning materials according to their level of knowledge and ability. Learning platforms are able to provide relevant content recommendations based on each learner's needs and preferences. Not only that, students can also choose a learning path that matches their personal interests and goals. Through this personalised approach, learners can experience more engaging, relevant and effective learning. They feel supported and valued in their learning journey, which in turn increases their motivation to actively engage and achieve maximum learning outcomes.

Thus, the results of this study provide empirical support to the view that technology, especially in the form of an LMS, can be an effective tool for improving the quality of education. This conclusion suggests that investment in the development and implementation of an LMS can play an important role in improving the efficiency and effectiveness of the education system, as well as empowering students to become more independent and adaptive learners in a changing era. Therefore, LMS integration should be considered as a strategy that has the potential to have a positive impact in improving the quality of education and empowering students to achieve academic success and self-development.

There are many LMS platforms that have been used by many teachers in Indonesia. Anugerah and Kusuma (2021) in their research stated that the Learning Management System (LMS) that is widely used in learning is Google Classroom, which states that Google Classroom is preferred by students with a score of 53%, and Setiawan (2021) in another study also stated that before the covid-19 pandemic, Moodle was the LMS platform that was most preferred for use, where the moodle platform scored 53.17% compared to other platforms. While after Covid-19 appeared, the LMS platform that was more widely used was Google Classroom with a percentage of 69.15%.

Other LMS usage data is also obtained from the website trends.builtwith.com, which monitors technology usage trends around the world. From the last update data on 24 June 2023, it states that Moodle is a very popular LMS to use in Indonesia. Broadly speaking, there are 28 Learning Management Systems (LMS) used by 8,597 E-learning websites in Indonesia. The following is the percentage of the most widely used E-learning platform or Learning Management System, namely: Moodle 37%, Sekolahku 26%, LearnPress 13%, Tutor LMS 12%, Free school website 6%, LearnDash 4%, and the remaining 2% are other LMSS.

According to the researchers in the journal, the cause of the lack of use of other platforms is due to the lack of socialisation and advertisements shown to the public about these platforms, and other causes such as ease of use and the internet quota needed to access these platforms.

But besides Edmodo, Moodle, and Google Classroom which are widely used by educators, it turns out that there are still many LMS that can also be used by educators, one of which is LMS Canvas. Many people mistakenly define LMS Canvas as Canva. Both are very different types of platforms and their uses. Canva is a graphic design creation platform used to create social media graphics, presentations, posters, documents and other visual content. Whereas LMS Canvas is an application-based learning platform that provides and facilitates features in E-Learning based learning to provide a unique and intuitive learning experience for students.

Canvas is actually no less good to use as an e-learning-based digital learning media. This is as mentioned in a survey conducted in America which states that Canvas has a very rapid development of its use in America for 7 years from 2013-2019. This can be seen in the graph below:
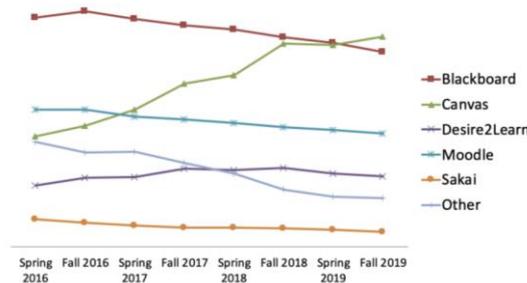

Figure 1. LMS market share in US Higher Education Autumn 2013-2019 by institution (2000+FTE; Edutechnica, 2019)

In addition, according to the research results from Santiana, et al (2021) mentioned that in their research, students access Canvas for approximately 1-2 hours a week. Students access it mostly to follow some learning activities designed by the teacher, including reading learning modules, joining online discussions, and working on assignments given by the teacher. Students also believe that during online learning, Canvas is an easy-to-use LMS, and provides many features that help them learn.

Santiana, et al (2021) mentioned that besides providing various features, Canvas also has a layout that attracts students' attention in online learning. Teachers can also organise learning modules in a structured manner, so students can easily access any information they need in the LMS. In other words, the learning design provided by teachers in Canvas also helps students to follow the learning activities more easily.

Research on the effectiveness of the Canvas LMS platform was also conducted by Yana and Adam (2019) who examined the "Effectiveness of Using the LMS Platform as a Blended Learning-Based Learning Media on Student Learning Outcomes". In the study, Yana and Adam examined the level of effectiveness of 3 LMS including Schoology, Quizlet, and Canvas. Of the three LMS, although all three have different results, all three are proven to be able to increase student independence and learning outcomes. Yana and Adam (2019) mentioned that there was an increase in student learning outcomes using Canvas based on blended learning which can be proven by the difference in student learning outcomes scores of 10.41.

In addition to effectively improving learning outcomes, Canvas can also help improve students' critical thinking skills. This is evident from the results of research conducted by Afra, et al (2023) which shows that the use of Learning Management System based on Canvas instructure can improve students' critical thinking skills. This study shows

that the use of LMS learning media in the experimental class can increase the average value of students' critical thinking skills from 65.96 in the pre-test to 82.31 in the post-test.

From the results of the study, it can be concluded that the use of Learning Management System (LMS) such as Canvas is also proven to be effective as a learning medium. This finding suggests that Canvas LMS has the potential to positively contribute to students' learning experience and achieve the desired learning objectives. The facilities provided by Canvas, such as material management, interactivity and personalisation, appear to support the efficiency and effectiveness of learning.

Conclusion

Based on the results of previous research that researchers managed to collect from the google scholar search site, the results showed that the use of Learning Management System (LMS) has been proven to increase the effectiveness of learning in students. The learning outcomes of students' learning independence show a positive increase thanks to the use of LMS in e-learning. Another finding obtained is that in addition to Edmodo, Moodle, and Google Classroom which are widely used by educators, it turns out that there are still many LMS that can also be used by educators, one of which is the Canvas LMS. From the results of the search for journal articles, it is known that Learning Management Systems (LMS) such as Canvas have also proven effective as learning media.

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