

The Impactful Effect of E-Learning Study Method Towards Students Academic Achievements in General

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Abstract – This study aims to analyze the impact of the online learning or e-learning system on students' academic scores in general. This study uses previous research to review the infrastructure and factors of the E-Learning system in influencing students' academic scores. The research method of this research is using SLR (Systematic Literature Review). Research searches will be carried out on databases of journals that are known to the public, such as Springer, ResearchGate, Scopus, and others. Twenty-seven articles have been screened to fit the research criteria, collected, and reviewed. This study concludes that the E-Learning System gets honest feedback and is ignored, but indirectly has an impact on the actors in teaching and learning activities in the world of education. E-learning systems can provide solutions to problems at hand, but also create unfamiliar problems. The main factor in improving student learning experiences is student academic value.

Keywords: E-Learning; Online Platform; Education Systematic Online Learning; Academic Achievement; non-Academic Achievement

I. INTRODUCTION

Online learning has begun to be practiced in the past few years but only started to see a lot of use around 2020 due to the global pandemic, namely COVID-19. The COVID-19 pandemic is a new type of virus epidemic that started in Wuhan, China, and has spread significantly to all parts of the continent and country [32]. As a result of the virus pandemic, many countries must take emergency measures to anticipate the spread of the virus, namely physical distancing. These actions have an impact on the education infrastructure of the entire country. Educational institutions are forced to change their learning systems

and curricula into an online learning format [31]. The implementation of this drastic change forced students and teachers to adapt to the system. This change is felt in all aspects of teaching and learning activities, such as the delivery of material in class, the distribution of individual and group assignments, exams, etc., because everything is done online. Besides the academic learning activities, outdoor activities, such as extracurricular (especially sports and dances), PE subjects, and other programs or subjects that required open space and interaction between students were temporarily discontinued due to government policy and the anticipation of COVID-19.

At the time this literature review was made, most formal schools had gone through a transition period from a face-to-face learning system to an online learning system, also known as Systematic Online Learning. Systematic Online Learning has many functions, both for students and teachers, in teaching and learning activities. To access these functions, a container is provided to accommodate users, which is called a platform. A platform is a digital environment where an object or software in a system is executed to carry out its tasks [35]. There are already several online learning platforms that can be used by educational institutions to help teach and learn, namely Microsoft Teams, Google Classroom, Moodle, Coursera, Skillshare, Udemy, Dicoding, and many other online learning programs/websites. Each of these online learning platforms has common and unique features that can be used by its users. Despite the differences in features, an online learning platform has features that help students and teachers communicate with each other [36].

This e-learning learning method reaps many pros and cons. Starting from its implementation, which is considered less effective than the face-to-face learning method, to the decrease in the level of students' scores, This is, of course,

a highlight where, at the beginning of the pandemic, not all students were able to accept this E-Learning learning method due to the unavailability of electronic devices or platforms that could support the method. Therefore, many parents are worried about their children’s learning achievements in school [34]. However, with development time, there are also increasingly affordable electronic devices and platforms that can make it easier for students to learn from the e-learning method. Platforms that continue to grow in terms of features and appearance are also considered to be able to increase students’ enthusiasm for learning. Therefore, the purpose of this study is to analyze the impact of the online learning method on the academic and non-academic achievements of students in an educational environment. Suppose the objectives of this research are achieved. In that case, this paper can be used as a reference material and a solution for updating and improving the online education system in terms of infrastructure for its implementation.

II. METHODS

2.1 Systematic Literature Review

To examine research revolving around the chosen topic, a systematic literature review (SLR) identifies, selects, and critically appraises material [28]. Before the systematic review is undertaken, the criteria should be explicitly outlined in a clearly defined methodology or plan. SLRs treat the literature review process as a scientific process, applying concepts of empirical research to make the review process more transparent and replicable and reduce the possibility of bias as opposed to traditional literature overviews, which often leave a lot to the authors’ expertise [29]. SLRs have become a fundamental methodology in the health sciences, which have built a dedicated infrastructure to carry out these reviews and continue to refine the method to address new research concerns [30].

The goal of a literature review is to better grasp the existing research and discussions on a specific topic or field of study and to provide that information in the form of a written report. To obtain valid results, we collected and studied research from published journals from well-known journal database sites, like Scopus, Springer, IEEE Xplore, etc. Table I shows the research questions for this research.

2.2 Research Question

Table I. Research Question

No	Research Question	Motivation
1	How is the feedback and satisfaction from students and teachers in using the E-Learning learning method?	Researching feedback and satisfaction from students and teachers in using the E-Learning method
2	How can the E-Learning Method affect students’ academic achievement?	Studying the E-Learning method can affect students’ academic achievement
3	What are the factors of the E-Learning Method that can affect students’ academic achievement?	Looking for factors from the E-Learning method that affect students’ academic achievement

4	How E-Learning infrastructure affects students’ academic achievements?	Analyze and describe the effect of E-Learning infrastructure on students’ academic achievement
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2.3. Results Finding

To answer all the questions above, we conducted a search on published research paper in well-known journal databases sites with some keywords as the benchmark. The keywords are “E-Learning” AND (Platform OR Education) OR “Online Learning” AND (Platform). Table II shows the results of the search.

Table II. Search Results of Database Journal

No	Database	Search Results
1	Scopus	14,543
2	IJERE	81
3	SAGE Journals	282
4	IEEE Xplore	686
5	ResearchGate	100
6	Springer	3211
Total		18.903

To filter the searched journals and articles, we made inclusion and exclusion criteria. Table III shows the criteria.

Table III. Criteria to filter the search results

Criteria		
Inclusion	Z1	Journal/Article written in English
	Z2	Journal/Article published around 2017 – 2022
	Z3	Journal/Article have a strong argumentative and solutions aspect
	Z4	Full-text article
Exclusion	X1	Comparable articles from different database journal
	X2	Journal/Article not related to the keyword and the topic
	X3	Not computer science related

For inclusion, we applied Z1, Z2, and Z4 to filter the search results. And then, add exclusion with X3 to filter furthermore. After filtering, we did a second filter by applying criteria inclusion Z3 and exclusion X1, X2. After those filtering with the criteria, the total paper that we collected is twenty-seven results. Table IV shows the result of the filtering process and will be the main reference for the review.

Table IV. Number of Article after filter

Index	Publication Media	Year	Country	Article Found	Total
1	Q1 Journal	2022	Indonesia	1	11
			Indonesia	2	
		2021	Greece	1	
			USA	1	
			Malaysia	1	
		2020	Netherlands	1	
			Nigeria	1	
			UK	1	
		2019	USA	1	
		2017	Portugal	1	
2	Q2 Journal	2021	Germany	1	7
			Taiwan	1	
		2020	Germany	2	
			India	1	
			Switzerland	1	
2019	UK	1			
3	Q3 Journal	2021	Indonesia	2	4
			Germany	1	
			USA	1	
4	Conference Proceedings	2022	Costa Rica	1	5
			Netherlands	1	
		2021	Peru	1	
			USA	1	
		2019	Russia	1	
Total					27

III. RESULTS AND DISCUSSION

3.1 E-Learning method’s Feedback and Satisfactions from both the students and teachers perspective.

Since the pandemic, students and teachers must be prepared to confront challenges and embrace the way of online learning, according to one study on the effects of switching from traditional learning methods to full online learning [16]. The readiness of students and lecturers is influenced by the experience of utilizing the online learning platform, according to Chang, Wang, Lin, Cheng, and Chiang [17]. Numerous detrimental effects, including stress, overload, and other issues, will occur if either pupils or teachers are not prepared. These two papers eloquently and candidly outline the issues with the e-learning strategy incorporated into the educational curriculum.

Online learning platforms can play a part in overcoming the challenges that students and teachers must encounter in order to discover answers to these issues. They are unconcerned about the online learning platform used as long as they believe it will aid in their learning by fostering knowledge [1]. This assertion is consistent with the paper’s findings, which show that a subject’s design greatly enhances students’ success in online courses. The research presented in this report also suggests that online course designs need to be clear and consistent, with crucial

information provided. so that students can understand how beneficial the e-learning system is to them [8].

Table V. Lists of feedback and satisfaction types

No	Type of Feedback and Satisfactions	References
1.	Obligatory	[16] [17]
2.	Positive	[1] [8]

3.2 E-Learning method in affecting students’ academic achievement.

Discord is one of the online learning media platforms that students frequently utilize for interaction. One of the online learning media platforms is Discord Gaming, which was initially developed as a TeamSpeak program. It can now be transformed into an application to support e-learning or online teaching and learning activities [19]. University and college decision-makers can benefit from using online learning platforms to enhance student academic performance and job satisfaction when planning, implementing, and implementing learning platforms at their institutions.

The study’s findings suggest that a variety of factors contribute to students’ performance and happiness in online classrooms during the COVID-19 epidemic. One was the added responsibility for teachers of online courses throughout the pandemic since they had to adjust to a shifting environment, hone their technological abilities throughout the process, and encourage new students’ technical expertise in this setting [8].

According to the data we read, using the online learning system has no discernible impact on students’ academic achievement [11]. The academic achievement of students is comparable to that before the online learning system was compulsory, and it may even be better. However, the numerous technical requirements of the online learning system, which take hours in addition to school obligations, cause students’ stress levels to rise. As a result, in order to maintain their academic performance, students sacrifice their free time to finish projects from school or online learning activities [16].

Table VI. Lists of purposes

No	Purposes	References
1.	Examples of an E-Learning Platform	[19]
2.	What affects the students’ performance	[8]
3	Result of student academic performance during pandemic	[11] [16]

3.3 The factors of the E-Learning method that affect students’ academic achievement.

Online learning offers technical and motivational characteristics for students to enhance self-taught or autonomous learning attitudes, think critically, dare to ask questions, have opinions, and other aspects [10] [13]. This is in addition to the appearance and consistency of the interface. E-learning also lowers the expense of commuting and improves the efficiency of students’ and teachers’ time in other facets of everyday life. E-learning can enhance the caliber of student learning with all these benefits [12].

Gopal, Singh, and Aggarwal came to the conclusion that students' academic success is greatly influenced by the appearance and consistency of the online learning platform [8]. Huang also observed that students' perceptions of the effectiveness of the online video learning platform are the most crucial determinants of their motivation to continue utilizing it [1]. In other words, the use of internet video conferencing technologies should be straightforward and uncomplicated. The online video conferencing software used in class instruction must be easy to use, especially for students who have never used it before.

In contrast to what was previously stated, the findings of the study conducted by Mahyooob Research reveal the opposite outcome, namely a decline in students' academic performance brought on by the difficulties in accessing some online learning platforms [6]. Because of this, some students are required to use substitute online learning tools while class is in session. When statistics are taken from the average and the survey paper's findings, network issues emerge as the biggest issue obstructing daring teaching and learning activities. Students and teachers are unable to take part in teaching and learning activities if the network is unplugged. In addition to technological issues, the bold display makes it challenging for teachers to discipline students during teaching and learning activities. In order to address this, Ferri, Grifoni, and Guzzo's research suggests that professionals, decision-makers, educators, schools, students, and families collaborate to create accessible learning environments, additional educational resources, and tools that can uphold sociality, inclusivity, and accessibility in education [9].

Table VII. Lists of Factors that affects achievements

No	Types of factors towards achievements	References
1.	Factors that improve achievements	[10] [13] [12] [8] [1]
2.	Factors that lower achievements	[6]
3.	Countermeasures against negative factors	[9]

3.4 How the E-Learning infrastructure affects students' academic achievement.

In the COVID-19 era, which involves online learning, the necessity for easy internet access is imperative. The success of current learning is ensured by factors such as student characteristics, internal motivation, instructor/lecturer qualities, infrastructure, system quality, course quality, and information, as well as an online learning environment. The infrastructure and quality of the system have the biggest impact on the success of online learning of the six factors that have positive implications [2].

It was discovered in a study that only the usage of technology increased following the changeover, whereas motivation, self-efficacy, and cognitive engagement all declined. According to Patricia's research, the information is crucial, but without the right circumstances, students' risk having a bad experience once more and losing interest in what they are learning [5].

According to a study, distant education institutions' readiness was also assessed using their e-learning

infrastructure and students' unique cognitive abilities. A Learning Management System (LMS), technological gadgets, communication programs, and internet accessibility are all part of the e-learning infrastructure. Universities are encouraged to arrange workshops and training sessions, offer teleconferencing tools, and give teleconferencing services, according to studies that claim the government has to provide adequate financial support to strengthen the e-learning process [27].

Table VIII. Lists of Aspects of the Infrastructure

No	Types of Aspects	References
1.	Positive Aspects of the Infrastructure	[2]
2.	Negative Aspects of the Infrastructure	[5]
3.	Preparation needed for the infrastructure	[27]

3.5 Discussion

In the COVID-19 era, which involves online learning, the necessity for easy internet access is imperative. The success of current learning is guaranteed by factors including student qualities, internal motivation, teacher/lecturer characteristics, infrastructure, system quality, course quality, and information, as well as an online learning environment [2].

According to Al-Kumaim, Mohammed, Gazem, Fazea, Alhazmi, and Dakkak, students and teachers must be prepared to confront obstacles and embrace the method of online learning in light of the epidemic [16]. According to Huang's research, although students think that online learning platforms can aid them in learning by fostering knowledge [1], numerous unfavorable effects, such as stress, overload, and other issues, will occur if the students are not prepared [17].

The usage of online learning tools demonstrates that a variety of factors contribute to students' performance and happiness in online classes during the COVID-19 epidemic [8]. Huang's study also came to the conclusion that students' perceptions of the usefulness of the online video learning platform are the most important element influencing their willingness to use it in the future. The online conferencing software used in classes must be easy to use, especially for students who have never participated in an online video conference [1].

Gopal, Singh, and Aggarwal concluded that students' academic success is greatly influenced by the appearance and consistency of the online learning platform [8]. Online learning includes technical and motivational characteristics for students to develop their self-taught or independent learning attitudes, think critically, dare to ask questions, have opinions, and other aspects in addition to the appearance and consistency of the interface [10] [13].

IV. CONCLUSION

The E-Learning approach has an indirect impact on students' academic performance in the educational system, according to the findings of this SLR study. The E-Learning infrastructure offers a distinct learning experience and alters

the learning system in schools and universities, technically and psychologically, even though their feedback is not particularly significant for students, lecturers, and staff in the world of education. The best solutions for tackling significant issues, like a pandemic, are provided by the E-Learning system, but it also generates modern problems that have an effect on students from a technical perspective, like network issues and unsupported devices, to the motivational aspect, where students are too “free.” These issues may prevent students from advancing academically. As a result, the E-Learning infrastructure takes on the role of becoming the most crucial aspect of teaching and learning activities. It is possible to prepare students, teachers, and staff for the world of education by enhancing the quality of the contents of the learning management system (courses, environment, communication, etc.), socializing the E-Learning system, and receiving financial aid from the government.

It is envisaged that additional research would shed light on E-Learning system-related problems and identify subgroups of society that it should specifically target. In order to use papers with specific nation criteria, such as developed countries and developing countries, additional study is also advised. It is also advised that the amount of papers utilized in this study be replicated.

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