

The Impact of Using Mobile Learning Applications on the Development of Students' Digital Literacy

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ABSTRACT

Background. The use of mobile learning applications has influenced students' digital literacy levels. The use of information technology as a learning medium, including mobile learning, can influence students' motivation to learn and make learning easier and faster. Using mobile learning applications can also increase students' digital literacy, especially in terms of connections.

Purpose. The aims of this research are to identify the impact of using mobile learning applications on the development of students' digital literacy, assess students' abilities in using mobile learning applications, determine how the use of mobile learning applications is effective and efficient in increasing students' digital literacy, and assess the impact of using mobile learning applications on the development of digital literacy student.

Method. The method used in this research is a quantitative method. This method is a way of collecting numerical data that can be tested. Data was collected through distributing questionnaires addressed to students. Furthermore, the data that has been collected from the results of distributing the questionnaire will be accessible in Excel format which can then be processed using SPSS.

Results. From the research results, it can be seen that Mobile learning apps can help students learn more about digital literacy. This application can offer a variety of learning materials and information related to digital literacy, so that students can better understand and expand their knowledge.

Conclusion. From this research, researchers can conclude that the impact of using mobile learning applications on the development of students' digital literacy can increase students' interest in learning, help them learn digital literacy and students' learning resilience.

KEYWORDS

Learning, Mobile, Student

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INTRODUCTION

Mobile is a technology that allows people to use technology through mobile software such as smartphones, tablets or computers in various aspects of life, including learning (Hu & Assaad, 2024). Mobile learning applications can help students increase their digital literacy, thereby increasing their ability to use digital technology (Yu et al., 2024). Mobile learning applications can be used via mobile software to assist students in developing digital literacy



(Li et al., 2024). This application can provide various learning materials and information about digital literacy, which can help students understand and expand their knowledge about the topic (Cascella et al., 2024).

Mobile learning apps can help students become more proficient in digital literacy, enhancing their abilities (Harrison et al., 2024). This application can provide various kinds of learning materials and information about digital literacy, which can help students understand and expand their knowledge (King & Carbonaro, 2024). Learning is an activity carried out by students in learning, while learning is an activity carried out by teachers to help students learn (Muscogiuri et al., 2024). Mobile learning applications can improve students' digital literacy. However, application use must be adjusted to various factors that can influence students' digital literacy, such as technological skills, policies and social and economic status.

Mobile learning applications have the ability to assist students in expanding their understanding of digital literacy and increasing their ability to use it (Fang et al., 2024). Available on the market has a variety of study materials and features, so users can choose the application that best suits their learning style and needs (Honkonen et al., 2024). Literacy is a student's ability to understand, remember, and use language and information provided in the form of text, images, or audio (Short et al., 2024). The use of digital literacy also helps students develop technology skills that are important for the world of work, understand and use information found online, and build their character.

Literacy can be more broadly defined as a person's ability to find, understand, interpret, evaluate and use information and communication in various forms of media, both print and digital, to create life skills that are beneficial to society (Wauters & Dirks, 2024). In addition, digital literacy helps students think critically and creatively, understand and use information found online (Waghid, 2024). The use of digital literacy helps students develop important technology skills in the world of work, understand and use online information, and build their character (Khanna, 2023). In addition, digital literacy helps students become wiser in using social media, become better at conducting online research, and become better at thinking critically and creatively.

The definition of literacy has evolved along with the challenges of the times and is defined as a person's ability to process and understand information during the reading and writing process (B. Wang et al., 2024). The use of digital literacy helps students develop important technology skills in the world of work, understand and use online information, and build their character (Jia et al., 2024). Additionally, digital literacy helps students become wiser in using social media, become better at conducting online research, and become better at critical and creative thinking (Jean-Berluche, 2024). In the digital era, students are entering a widely connected world and need support to develop necessary skills, such as adapting to change, thinking critically, and solving complex problems.

Digital literacy can also help students access various online resources, allowing them to gain broader and more up-to-date knowledge (López-García et al., 2024). Teachers have an important task to teach students in the digital era, and they must be role models in the use of technology, guide students in digital literacy, and facilitate collaborative and creative learning (Zellner, 2024). Students who have digital literacy can also help access various online resources, which allows them to gain broader and more up-to-date knowledge (Barakat et al., 2024). Increase students' digital literacy and equip them with necessary skills, such as evaluating data, actively participating in digital society, and understanding online security.

The type of method used in this research is a quantitative method. This method is used so that the final results of the data processing can be known clearly and precisely regarding the impact

of using mobile learning applications on the development of students' digital literacy. The data collection process was obtained by the researcher from the results of the respondents' answers that the researcher had carried out. Researchers created a questionnaire with 10 questions, then distributed it via Goggle from. After the data is collected, the data will be calculated into a percentage and presented in table form. In processing research data, researchers use SPSS software which aims to make it easier for researchers to process data, and the data results are more relevant.

From the results of the explanation above, researchers assume that the impact of using mobile learning applications on the development of students' digital literacy can be a factor in increasing students' learning motivation. This research also aims to determine the advantages of the impact of using mobile learning applications on the development of students' digital literacy used in the learning process so that the learning process can improve students' digital literacy skills. In this research, the researcher also used quantitative methods, the data obtained came from the results of the questionnaire that the researcher submitted. Furthermore, the researcher really hopes that the next researchers will research and study more deeply the impact of using mobile learning applications on the development of students' digital literacy.

RESEARCH METHOD

Research design

This research uses a quantitative research design, which uses statistical processes to present data in the form of numbers. Researchers created twenty questions to collect information about the research to find out the results. Researchers will ask respondents to answer the questions asked, which will be presented in the form of tables and percentages. The purpose of processing this data with the SPSS application is to compare the results of respondents' answers. After this comparison, researchers can provide solutions to any information they get about the impact of using mobile learning applications on the development of students' digital literacy.

Research procedure

In this study, researchers investigated about the impact of using mobile learning applications on the development of students' digital literacy. The aim of the researcher is to investigate this matter so that the researcher can collect, analyze and provide understanding of the data that has been collected. In creating questions, researchers use good language that is easy for teachers and students to understand. This aims to ensure that teachers and students who respond to questions asked by researchers can be answered quickly. That way, it will be easier for researchers to test the data being investigated regarding the impact of using mobile learning applications on the development of students' digital literacy.

Research subject

In researching the impact of using mobile learning applications on the development of students' digital literacy, researchers of course determine the subject for their research. In this research, the subject of this research is aimed at students from various educational institutions. Before the questionnaire was distributed by the researcher, the researcher asked the respondents first to be willing to spend their time filling out the questionnaire that the researcher would distribute. The questionnaire each contains 10 questions about the impact of using mobile learning applications on the development of students' digital literacy.

Research Ethics

After the researcher carried out several stages as previously explained, in conducting research, the researcher also paid close attention to ethics and manners in research. Researchers believe that ethics needs to be considered whenever and wherever, including in the research being

conducted. This aims to gain trust and readiness from the respondents or those who are the objects of this research. Furthermore, in this research, the researcher also explains information related to the research, one of which is information in filling out the questionnaire. This information was explained by the researcher so that the respondents were ready and willing to voluntarily provide responses and answers to the questions asked by the researcher.

Data Collection and Analysis

Data collected by researchers in examining the impact of using mobile learning applications on the development of students' digital literacy will be processed into the SPSS application. Then the data that has been obtained will be presented by researchers in the form of tables and diagrams. The purpose of presenting it in table and diagram form is to be able to see a comparison of the results of research that has been carried out by researchers regarding the impact of using mobile learning applications on the development of students' digital literacy. Next, the obtained data results are converted into percentages or averages. Then the data results will be tested again using the T-test.

Table 1

Categories of the Impact of Game-Based Learning Integration on Student Motivation and Engagement

No	Earning Category	Level of education	Percentage (%)
1	Strongly agree	Student	>90%
2	Agree	Student	45-89%
3	Disagree	Student	16-45%
4	Don't agree	Student	5-15%

Figure 1

Data Collection and Analysis Flow

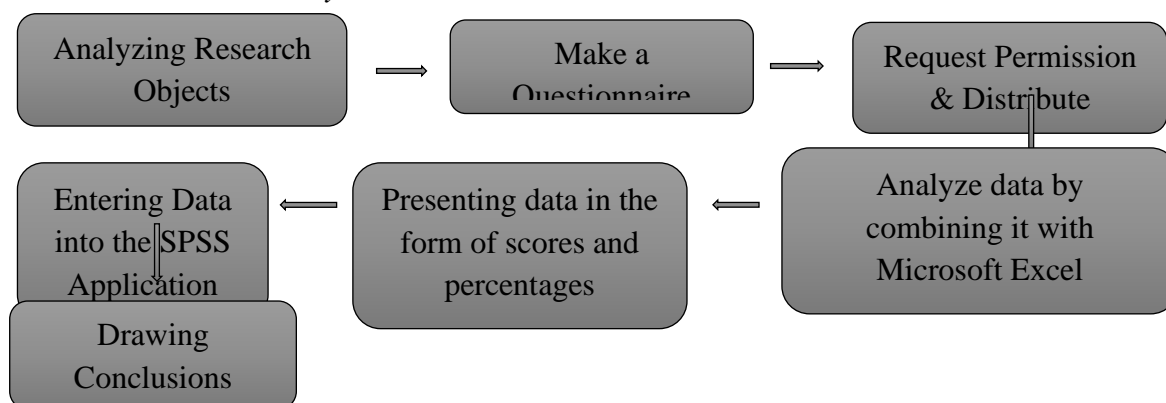


Figure 1 above shows how researchers collect and analyze research data. The results of data acquisition came from respondents' answers to the researcher's questions. Furthermore, in the quantitative research method, the researcher will also test again using the T-test which will be used to enter research data into the SPSS application. The number of questions asked by the researcher was 20 questions, where each question was divided into ten questions with different questions. Only after the questionnaire is distributed can researchers formulate and draw conclusions from the research object.

RESULTS

The Impact of Using Mobile Learning Applications on the Development of Students' Digital Literacy

Digital literacy refers to improving students' ability and understanding in using information and communication technology (ICT) to read, write, relate, and evaluate information. Digital literacy also includes understanding and skills in accessing, interpreting, and using information found on the internet and social media. The aim of increasing student digital literacy is to increase students' ability to use digital technology as a tool for learning, sharing and accessing useful resources. This will help students adapt to technological advances and become skilled people in the culture of reading, writing, processing and evaluating information in this digital era.

Table 2

Summary of Percentage Results from Respondents' Answers

No.	Question	Strongly agree	Agree	Disagree	Don't agree
1	The use of mobile learning applications can have an influence on students' ability to use ICT	33%	52%	10%	5%
2	Mobile applications can help students to access various useful information	30%	45%	15%	10%
3	Teachers need to provide direction in using mobile applications in learning	20%	77%	3%	0%
4	Using mobile applications can simplify the learning process	45%	35%	10%	10%
5	Students become more enthusiastic about learning by using mobile learning applications	44%	52%	4%	0%
6	Mobile learning applications can help students manage their study time	20%	60%	16%	4%
7	Mobile learning applications can help students understand learning material in a more practical way	65%	35%	0%	0%
8	Mobile learning applications can improve student learning experiences	25%	66%	4%	5%
9	Mobile applications are one application that can help students with different learning styles	50%	50%	0%	0%
10	The risks of using mobile applications have a greater impact on students	85%	15%	0%	0%

Table 2 above is a distribution of questionnaires that have been carried out by researchers. The questionnaire contains 10 related questionsThe Impact of Using Mobile Learning Applications on the Development of Students' Digital Literacy. It can be seen from the first question

regardingThe use of mobile learning applications can have an influence on students' ability to use ICT, obtaining results with a percentage of 52% agreeing. Next, the second question regarding mobile applications can help students to access various useful information, getting a percentage result of 45% agreeing. Furthermore, the third question regarding teachers needs to provide direction in using mobile applications in learning obtained a percentage result of 77% agreeing. The fourth question regarding the use of mobile applications can facilitate the learning process, getting a percentage of 45% strongly agree. Question number five regarding students becoming more enthusiastic about learning by using mobile learning applications, received 52% who agreed.

The sixth question regarding mobile learning applications can help students manage their study time, getting as much as 60%. The seventh question regarding mobile learning applications can help students understand learning material in a more practical way, obtaining a percentage result of 65% strongly agreeing. The eighth question regarding mobile learning applications can improve students' learning experience, obtained a percentage of 66% who agreed. For the ninth question regardingMobile applications are one of the applications that can help students with different learning styles, getting the same percentage results of 50% for the strongly agree option, and 50% also for the agree option. For the last question regardingThe risks of using mobile applications have a greater impact on students, getting a percentage of 85% who strongly agree.

Table 3

Summary of Percentage Results from Respondents' Answers

No.	Question	Strongly agree	Agree	Disagree	Don't agree
1	Mobile learning applications can divert students' attention during the teaching and learning process	56%	29%	14%	1%
2	Mobile learning applications can make students addicted to using digital devices	30%	70%	0%	0%
3	Mobile learning applications can increase student interaction with teachers	44%	50%	3%	3%
4	Mobile learning can give students freedom in learning	45%	36%	9%	10%
5	The development of students' digital literacy is superior to that of adults	20%	80%	0%	0%
6	With the mobile application, the learning process can be done online	60%	40%	0%	0%
7	Today's digital developments require an adequate internet network	66%	34%	0%	0%
8	Mobile learning applications can expand students' understanding of learning material	25%	39%	26%	10%
9	Many mobile learning applications provide online platforms for learning	80%	5%	10 %	5%
10	The use of mobile applications must be used properly and correctly	77%	23%	0%	0%

From the statement in the table above, it can be seen that the number one question asked by researchers regarding mobile learning applications can divert students' attention during the teaching and learning process, getting a percentage result of 56% strongly agreeing. The second question regarding mobile learning applications can make students addicted to using digital devices, getting a percentage result of 70% agreeing. The third question regarding mobile learning applications can increase student interaction with teachers, getting results of 50% agreeing. In the fourth question regarding mobile learning can provide freedom in learning for students, the highest result was 45% who strongly agreed.

Next, question number five concerns The development of students' digital literacy is superior to that of adults, with 80% agreeing. The sixth question concerns With the mobile application, the learning process can be done online, as many as 60% strongly agree. The seventh question regarding current digital developments requires an adequate internet network, getting results of 66% strongly agreeing. The eighth question regarding mobile learning applications can broaden students' understanding of learning material, getting results of 39% agreeing. The ninth question concerns Many mobile learning applications provide online platforms for learning, getting results as much as 80% strongly agree. And the last question regarding the use of mobile applications must be used properly and correctly, as many as 77% strongly agreed.

Diagram 1

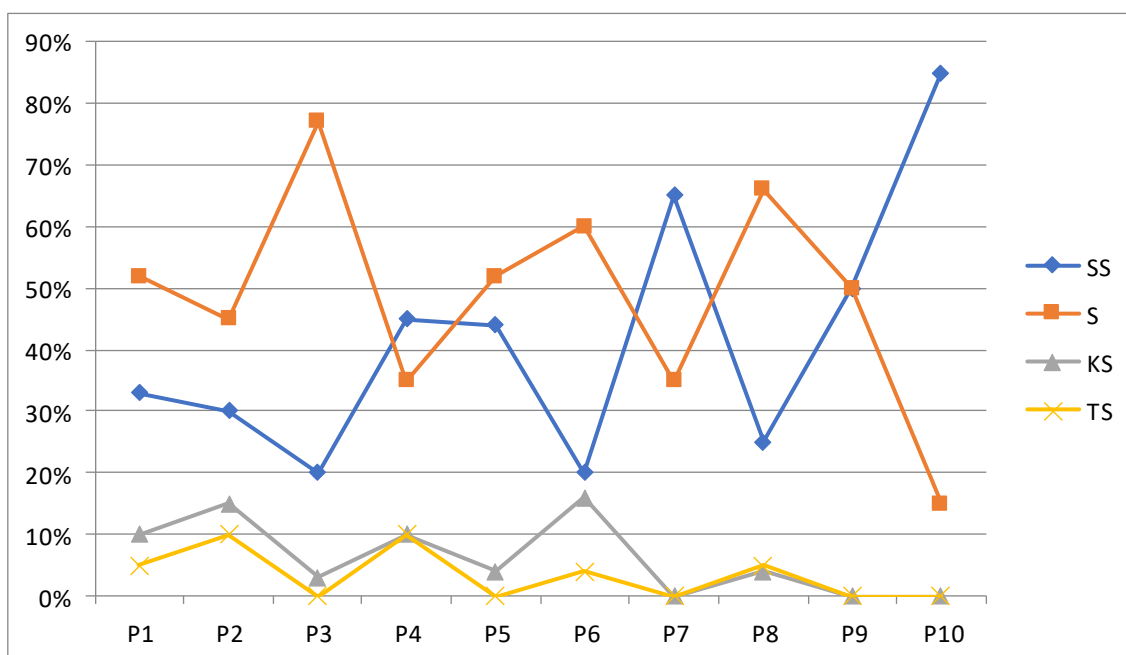


Diagram 2

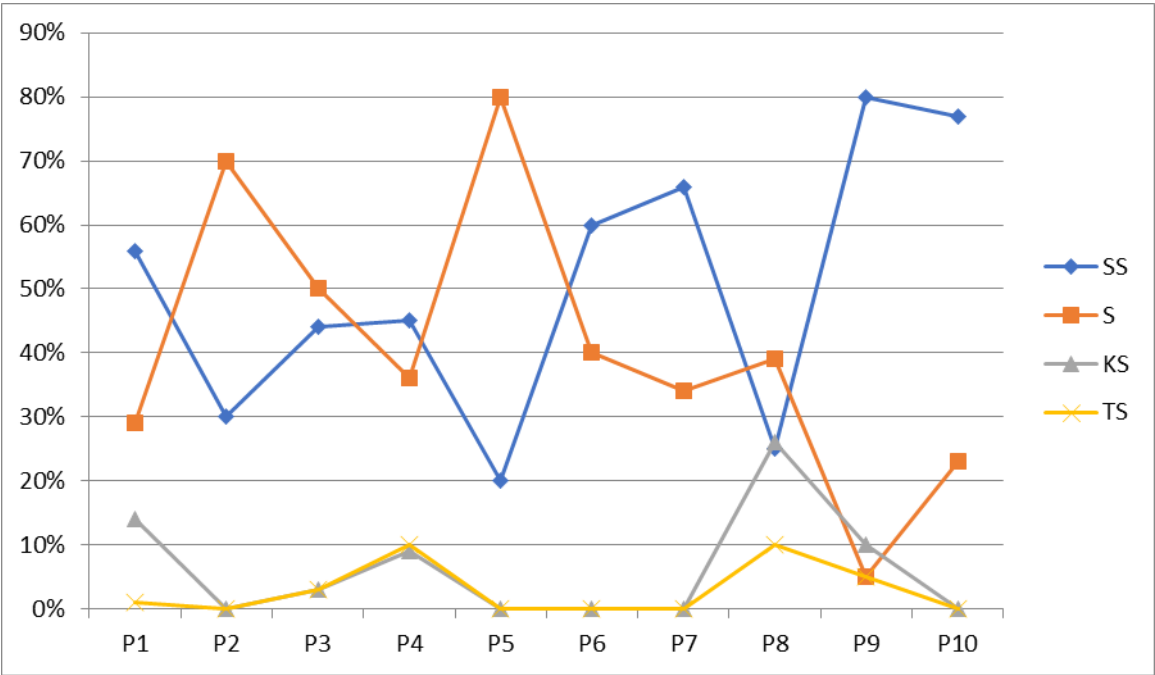


Table 3
T-test regarding the impact of using mobile learning applications on the development of students' digital literacy

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error
Pair 1	PRE TEST	46,0000	20	20.91587	4.67693
	POST TEST	44.6500	20	19.71981	4.40948

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PRE TEST & POST TEST	20	-.865	,000

Paired Samples Test

		Paired Differences		Std. Error	95% Confidence Interval of the Difference	
		Mean	Std. Deviation		Lower	Upper

Pair 1	PRE TEST - POST TEST	1.35000	39.23650	8.77355	-17.01325	19.71325
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Based on the results of table 3 above, it is a T-test using the SPSS application. From the research results, the researcher can conclude that the T-test in the first output section explains the mean as the average. In the Pre Test the average number produced was 46,0000, while in the Post Test section the result was 44.6500. Based on these results, it can be formulated that there are differences in the results of the respondents' answers. Next, in the Paired Samples Correlations section, you get a correlation of -865, and the sign size is 000. Next, in the Paired Samples Test section, you get a result of 39.23650 in the Std section. Deviation, while in the Std. Error Mean obtained a result of 8.77355. Based on these results, the impact of using mobile applications on the development of students' digital literacy can have an influence on the learning process and students' understanding of digital literacy.

Table 4

T-test regarding the impact of using mobile learning applications on the development of students' digital literacy

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error
Pair 1	PRE TEST	6,2000	20	7.30969	1.63450
	POST TEST	3,1500	20	3.99045	.89229

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PRE TEST & POST TEST	20	,751	,000

Paired Samples Test

		Paired Differences		Std. Error	95% Confidence Interval of the Difference	
		Mean	Std. Deviation		Lower	Upper
Pair 1	PRE TEST - POST TEST	3,05000	5.05210	1.12968	.68555	5.41445

Furthermore, in table 4, there are also the results of research using the T-test. It can be seen in the first output section that the Pre Test results were 6.2000, and the Post Test results were 3.1500. In the Paired Samples Correlations section, we obtained a Correlation of 751, with a Sign result of 000. Meanwhile, in the Paired Samples Test section, we obtained a result of 5.05210 in the Std section. Deviation, and Std. The mean error is 1.12968. Based on the results of this research, it

can be seen the differences between each of the respondents' answers regarding The Impact of Using Mobile Applications on the Development of Students' Digital Literacy.

DISCUSSION

The Impact of Using Mobile Applications on the Development of Students' Digital Literacy.

Technology literacy is closely related to digital literacy skills. Technology in learning can change the learning model that will be implemented by teachers (Žabkar et al., 2023). By leveraging digital literacy, such as the use of mobile learning applications, innovative learning approaches allow teachers to collaborate with students in creating different learning environments (Kesarwani et al., 2023). Generation Z is a generation that is familiar with digital devices and integrated learning models, which determine the learning styles of today's students (Zhu et al., 2023). Therefore, teachers as educators in schools must be able to collaborate on the development of digital literacy with students while studying.

It was further explained that familiarizing students with searching, processing, analyzing and interpreting information and data obtained during face-to-face and online learning improves digital literacy skills (RiStanto & Darmawan, 2020). It is hoped that by increasing digital literacy skills, students will have the ability to think creatively and critically. Students will gain improvements in three aspects of digital literacy skills, namely digital competence, digital use, and digital transformation (Balcou-Debussche et al., 2023). This increase occurred regardless of their previous knowledge and level of digital literacy. Having these three skills will make it easier for students to understand and continue to develop students' digital literacy skills (Simamora et al., 2022).

One option for developing learning media is learning through mobile learning applications (Su et al., 2023). Learning mobility is intended to complement learning and give students the opportunity to learn whatever they need whenever and wherever they are (Wu et al., 2022). Mobile learning applications can develop learning media for students by using mobile learning applications intended for each student's cellphone or gadget (Zaoui Seghroucheni & Chekour, 2022). This is due to the fact that gadget operating systems have become the most popular systems among students today. By utilizing the development of digital literacy in the form of gadgets, the use of mobile learning applications can be used effectively and efficiently in the learning process (Zhao et al., 2023).

Mobile learning is a learning model that is carried out anywhere and at any time using portable technology without the constraints of time and space (Mohammad et al., 2021). With its advantages, it is hoped that it will become an alternative learning source that can improve the learning process today. Education in the current digital literacy era usually requires alternative learning models that do not depend on time or space (Sivakumar et al., 2023). In addition, it is hoped that alternative models, such as the use of mobile learning applications, can help share and visualize information with students, so that the information becomes more interesting and easier for students to understand (Chen, 2023). The strategies and patterns that are expected from the use of information and communication technology in education in Indonesia can continue to develop well.

The impact of using mobile learning applications can bring benefits from the availability of teaching materials that can be accessed at any time and attractive visualization of the materials (Zeng et al., 2023). Therefore, the use of mobile applications can improve learning activities and increase student learning motivation. Another impact of using mobile learning applications can make learning spread widely, and can foster students' desire to study harder in order to improve students' academic performance (L. Wang et al., 2023). However, there are several

things that can cause difficulties in using mobile applications to help students learn digital literacy, such as technology addiction, or digital technology addiction which can lead to addiction to excessive use of technology.(Mhanni & Lagmich, 2023). Furthermore, limited access to technology, lack of digital skills, difficulty building personal relationships, information contamination can make it difficult for students to sort, assess and understand the information they encounter in the digital era. As well as the digital divide which can affect access and use of digital technology between those who have access and those who do not(Moutsis et al., 2023).

CONCLUSION

In the learning context, information technology can help teachers use various online platforms that will be used in the learning process. Not only teachers can take advantage of technological advances for the learning process, but students can also do so. The use of mobile learning applications refers to the use of information technology devices such as mobile phones, laptops and tablets which are used in the education and learning process. Mobile learning applications are a different way of learning because students can access relevant learning materials, guides and applications anytime and anywhere.

The aim of increasing digital literacy is to improve students' ability to use information and communication technology (ICT) to read, write, connect and evaluate information. Digital literacy also includes the ability and understanding to access, interpret and use information found on the internet and on social media. Teachers must be role models in the use of technology, guide students in digital literacy, and facilitate collaborative and creative learning. Digital literacy can also help students access various online resources, allowing them to gain broader and more up-to-date knowledge.

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