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RESEARCH ARTICLE

The Use of Digital Literacy Among Elementary School Teachers and Students in Rural Area in Madura Island

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ABSTRACT

With the rapid technological development in today's society today, digital literacy becomes very important. Digital transformation provides opportunities and possibilities in various fields, including in education. The aim of this research is to examine the use of digital literacy among elementary school teachers and students in rural Madura. This research focuses on elementary school teachers and students as the unit of analysis and data collection was carried out using descriptive quantitative methods. A total of 207 teachers in rural Madura who were respondents to this study provided responses via questionnaires. The research results show that the use of digital literacy for elementary school teachers and students, especially in rural Madura, is very beneficial for student development and learning outcomes. Further findings recommend that teachers can increase and develop their own competencies by attending workshops on digital literacy, the results of which can be applied and implemented in the classroom during learning. From this study, it can be concluded that an effective way to increase the use of digital literacy in schools for teachers and students is to improve media-based learning support facilities, as well as maximizing the use of digital media in all subjects. In the future, schools and the government need support, especially in rural areas, in providing adequate facilities, to support wider and more equitable use of digital literacy in schools.

INTRODUCTION

Introduction, In the current era of rapid technological development in digital society, digital literacy has become very important. UNESCO defines digital literacy as a skill that not only involves the ability to use technology, information and communication devices, but also involves the ability to learn, socialize, think critically, creatively, and inspire as a digital competition (Law *et al.* 2018; Laanpere 2019, Igwe *et al.* 2020; Mahdi 2020; Suyanto, 2023). Currently, extraordinary progress has been shown in the development of information technology, which is also able to influence the way people think, engage, learn and work (Khan *et al.* 2022). Digital literacy is known as a development in virtual learning, which has the potential to improve learning. The education system that runs in schools, in an all-digital world, is required to be able to keep up with needs that are constantly changing and changing the way we work and interpret life. It is important to understand that advances in the world of technology and its revolution in education have had an influence on and brought big changes to young people and also the society as a whole (Porat *et al.* 2018). This certainly requires a younger generation who are more skilled in managing knowledge and adding new abilities at all times.

The development of digital literacy has a big influence on society. Creativity in developing digital media is an increase in the capacity of individuals and groups to create and disseminate content to a wide audience. However, there are social responsibilities and competencies that must still be maintained and understood together, namely the competency to take into account the social consequences of online publications and especially responsibility toward children (Reddy *et al.* 2020). The world of education, which is currently following technological developments, has begun to apply digital learning methods in almost every subject taught. A great deal of educational content is created by teachers and even students, which supports learning with digital literacy. In the digital era, schools today must also be responsible in facilitating teachers and students to improve their digital skills.

As the pattern of technological development has previously required teachers to be aware of digital literacy, teachers must, therefore, also have skills in digital literacy skills, so that it is easier to implement digital media-based learning and to teach to students. A study conducted by Tohara (2021) explains that 21st century learning requires children or students to be able to develop learning skills, knowledge, life skills and, of course, skills in media literacy. For this reason, the school curriculum is adapted to the use of technological tools and strategies in order to provide teaching and learning strategies for students, including the Tohara's study focus on students with special needs. Tohara found that all students struggled to cope with their studies in the digital era due to limited digital literacy skills and the findings produced a model of digital literacy skills that consists of cognitive, technological and ethical skills, which are used as basic guidelines for exploring teaching and learning strategies.

The reach and ease of access to digital media does not always work well, and in fact encounters several obstacles. This is different for teachers and students in urban areas and in the upper middle class, this is not a difficult problem because they are equipped with adequate educational facilities and information spreads more quickly in urban areas. In a broader sense, in the city the facilities are all-in-one and support learning with digital media. During the COVID-19 pandemic, many facilities were built in connection with efforts to support the success of online learning. However, it turns out that, after the COVID-19 pandemic, the need for digital literacy has not disappeared or is no longer used, but has instead become the key to opening the digital world. It is not just because of the pandemic that digital media has become widely used, but rather that the pandemic has become a stimulus or catalyst to speed up the processes toward the digital era.

Sánchez-Cruzado *et al.* (2021). in their study discussing digital literacy challenges after the COVID-19 pandemic among school teachers found that the COVID-19 pandemic was seen as opening a new scenario that required teachers to have adequate digital literacy. This demand is based on the interests of the world of education, so that teachers can teach online and implement innovative and up-to-date educational models. This quantitative study involved 4883 Spanish teachers from all educational levels being respondents and participating to measure their digital skills. The results of the descriptive analysis show that, overall, teachers' self-perception of their digital skills is still low. This strengthens the previous explanation, that digital literacy has become a necessity, and not just because of the COVID-19 pandemic. Naturally, schools and the government must support the availability of these digital facilities (Nedungadi *et al.* 2018). In a digital society, the existence and use of digital literacy is absolutely necessary.

Therefore, it is very important to carry out this study in rural areas to find out how elementary school teachers and students use digital literacy in rural areas in Madura. The Madura region has a high illiteracy rate compared to other regions in East Java. Internet access in rural areas of Madura often experiences problems because the network is not strong enough. It is hoped that this study will be able to recommend policy formulations to overcome problems related to low digital literacy in rural areas and efforts to increase digital literacy, which is needed in the current era.

RESEARCH METHODOLOGY

This study uses quantitative methods with descriptive research type. This study was conducted on Madura Island, East Java. Madura is an island in East Java consisting of four districts, where the illiteracy rate is high. Therefore, this study chose a location in rural Madura to examine the use and benefits of digital literacy among elementary school teachers and students. In accordance with the fourth SDG development goal, namely quality education, one important effort that must be considered is awareness of technological literacy in the digital era.

The respondents in this study were school teachers in rural Madura, who taught in elementary schools. A total of 207 teachers who were respondents to this research came from several schools in rural Madura, East Java. Data collection was carried out through interviews, using a questionnaire instrument. The collected data were then analyzed using previous studies and relevant theories.

The data analysis technique in this research uses stages of data reduction, data presentation and drawing conclusions. In data analysis, data are presented in tabular form. Data are analyzed by considering the data in previous studies and theories relevant to the topic being studied. Conclusions on drawing on techniques are carried out based on the results and discussion in the study.

RESULT AND DISCUSSION

This part explains the use of digital literacy in Madurese rural schools. The results and discussion are studied in three main sub-discussions, namely; (1) Use of digital literacy and its benefits for elementary school teachers; (2) Use of digital literacy and its benefits for elementary school students; (3) Availability of facilities and school efforts to increase digital literacy for elementary school teachers and students.

Use of Digital Literacy and its Benefits for Elementary School Teachers in Rural Areas

Based on data collected from the 207 teachers studied, 199 teachers or 96.1% of respondents stated that they had used digital literacy in the teaching and learning process. Meanwhile, seven of them or 3.4% of respondents stated that they had not used digital literacy.

Table 1. Teacher Time Range in Using Digital Literacy (n = 207)

Teacher Time Range in Using Digital Literacy	F	%
Less than one year	49	23.7%
A year ago	44	21.3%
Two years ago	57	27.5%
Three years ago	26	12.6%
Four years ago	1	0.5%
Five years ago	5	2.4%
More than five years ago	19	9.2%
Already use digital literacy when using or utilizing technology	1	0.5%
Teacher doesn't use digital literacy	1	0.5%
The lack of school facilities and infrastructure	1	0.5%
Not mentioned	2	1%
Total	**207**	**100%**

Source: Primary data

Based on Table 1, the average longest time teachers have used digital literacy is two years ago, namely 27.5% or the equivalent of 57 teachers. Meanwhile, those who have only used it in the last

year reached 21.3% or 44 teachers. Meanwhile, 23.7% or 49 teachers used digital literacy in the teaching and learning process for less than one year. As many as 12.6% or 26 other teachers stated that they had used digital literacy for the last three years. Meanwhile, 9.2% or 19 teachers stated that they had used digital literacy for more than the last five years. Other teachers who were respondents in this research also stated that they had used digital literacy in various ways, some in the last four or five years, and that they may have used digital literacy when using or using technology. There were also those who stated that they did not use literacy digital for one reason, namely the lack of school facilities and adequate infrastructure.

Table 2. Reasons why teachers don't use digital literacy (n = 207)

Reasons why teachers don't use digital literacy	**F**	**%**
Complicated	12	5.8%
The school does not facilitate it	89	43%
Teachers do not have digital literacy skills	40	19.3%
No fees	18	8.7%
No answer	27	13.%
Total	**207**	**100%**

Source: Primary data

Digital literacy, which is increasingly widespread in its use, is still seen differently by some teachers. From the results of this research, it shows that there are several reasons stated by teachers regarding the use of digital literacy which is still not evenly distributed among educators. In Table 2, it can be seen that teachers do not use digital literacy because its use is complicated, this was stated by 12 teachers or 5.8% of respondents. Meanwhile, the main reason teachers do not use digital literacy is because schools do not facilitate it, stated by 43% or 89 teachers. There were 19.3% or 40 teachers who stated that they did not use digital literacy because they did not have digital literacy skills, and 8.7% or 18 teachers stated that they were constrained by costs.

The biggest obstacle for teachers in implementing digital literacy-based learning according to the results of this study is because it is considered complicated and some teachers do not have good digital literacy skills. This shows that there is a need for more intensive training for school teachers (Widana 2020), especially to overcome teachers' digital literacy skills which are still considered lacking. Saripudin et al., (2021) argued that teachers must also receive training in increasing the use of digital technology used when teaching so as to build their confidence in using digital technology in the classroom.

Table 3. Types of Digital Literacy Used by Rural Elementary School Teachers (n=207)

Types of Digital Literacy Used by Rural Elementary School Teachers	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
Teachers teach students to use information and communication technology	95	45.9%	112	54.1%	207/100%
Teachers create online classes based on video conferencing and have special methods when speaking in front of the camera so that the material can be understood by students	34	16.4%	173	83.6%	207/100%
Teachers are able to utilize resources in digital sources for learning	24	11.6%	183	88.4%	207/100%
Teachers collaborate with other teachers in training or workshops (e.g., creating technology-based modules)	9	4.3%	198	95.7%	207/100%

Teachers are familiar with various popular digital learning tools and media such as Google Classroom, email, WhatApp and other platforms	26	12.6%	181	87.4%	207/100%
Teachers teach students how to socialize on digital media	2	1.%	205	99.%	207/100%
Teachers conduct learning that is able to shape critical thinking, creative, and inspiring attitudes as digital competition.	13	6.3%	194	93.7%	207/100%
Not using digital facilities due to limited facilities and learning facilities in the form of IT and many students do not have cell phones	1	0.5%	206	99.5%	207/100%
The teacher uses a communication tool in the form of a cellphone with a YouTube application and then conveys the learning video in it	1	0.5%	206	99.5%	207/100%
Not mentioned	1	0.5%	206	99.5%	207/100%

Source: Primary data

Various kinds of facilities are available and can be used as learning media using digital literacy. As can be seen in Table 3, the types of digital literacy used by teachers include: (1) There are 45.9% of teachers who say they use digital literacy when teaching students by utilizing information and communication technology. (2) As many as 16.4% of teachers use digital literacy by creating video conference-based online classes and having special methods when speaking in front of the camera so that students can understand the material. (3) As many as 11.6% of teachers were able to utilize the resources available in digital sources for learning. (4) As many as 4.3% of teachers collaborate with other teachers in training or workshops (for example: creating technology-based modules). (5) As many as 12.6% of teachers are familiar with various popular digital learning tools and media such as Google Classroom, email, WhatsApp and other platforms. (6) As many as 6.3% of teachers held lessons that were able to form critical, creative and inspiring thinking attitudes as digital competitions. (7) Meanwhile, others stated that they used digital literacy by conducting socialization on digital media to students, or using communication tools in the form of cellphones which included the YouTube application and then conveying learning videos in it.

Table 4. Media used by teachers in accessing digital literacy (n=207)

Media used by teachers in accessing digital literacy	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
Google Classroom	145	70%	62	30%	207/100%
Zoom Meeting	11	5.3%	196	94.7%	207/100%
YouTube	31	15%	176	85%	207/100%
Email	0	0%	207	100%	207/100%
WhatsApp	10	4.8%	197	95.2%	207/100%
Telegram	0	0%	207	100%	207/100%
Instagram	0	0%	207	100%	207/100%
Regional library website	7	3.4%	200	96.6%	207/100%
Can use or show a self-made learning video	1	0.5%	206	99.5%	207/100%

Source: Primary data

Based on the findings above, the active use of digital literacy has been implemented by the majority of teachers. The most widely used digital literacy is a method of teaching students by utilizing technology, information and communication. Apart from that, another widely used digital literacy-based learning is creating video conference-based online classes with methods that are easy for students to understand. This is in line with Li and Yu (2022) that teachers in schools must have adequate digital literacy and be skilled to meet the new needs of innovative educational models now and in the future.

Several schools have implemented the use of learning media based on digital literacy. In this case, schools and teachers facilitate the provision of media to support learning needs, which have been adapted to digital literacy-based learning. The media used by teachers to access digital literacy is as shown in Table 4, namely, 70% of teachers said they used Google Classroom, 15% of teachers used YouTube, there were also 5.3% of teachers who said they used Zoom Meeting. Apart from that, as many as 4.8% said they used WhatsApp as a medium to access digital literacy, 3.4% said they used the regional library website, and others said they used image and audio-visual media through showing learning videos made independently by the teachers.

In the midst of increasing use of technology and developments in digital-based learning, all learning spaces are becoming easier in terms of access and use. The media used by teachers and those that are most dominantly used to support the teaching and learning process are Google Classroom and Zoom Meeting. Singh et al., (2020) stated that Google Classroom and Zoom Meeting were used during learning, especially when face-to-face restrictions were implemented. According to their findings, teachers have good mastery and knowledge in planning and implementing learning, interacting and assessing students based on the applications used.

These two media (Google Classroom and Zoom Meetings) have actually been around for a long time and their use has grown during face-to-face restrictions due to the COVID-19 pandemic in the last two to three years. However, after the pandemic, digital media is in fact increasingly being used and modified to suit the needs of each teacher and student.

Table 5. Lessons Teachers Use or Utilize in Digital Literacy Media (n=207)

	Yes		**No**		**Total**
	F	**%**	**F**	**%**	
Science studies	134	64.7%	73	35.3%	207/100%
Maths	3	1.4%	104	50.2%	207/100%
Social studies	56	27.1%	151	72.9%	207/100%
Religious studies	1	0.5%	206	99.5%	207/100%
Art studies	5	2.4%	202	97.6%	207/100%
Almost all subjects	1	0.5%	206	99.5%	207/100%
The selection of the use of digital literacy media depends on the subject matter, class time, and time of day	2	1%	205	99%	207/100%
All subjects use or utilize digital media judging by what material is taught by the students	4	1.9%	203	98.1%	207/100%

Source: Primary data

The application of digital literacy-based learning has been widely used by teachers in various subjects. Subjects that make greater use of digital literacy include science subjects. However, in other subjects there are also those who use digital literacy as a learning medium. As in Table 5, it is explained that there are at least five subjects that are actively taught using digital media. There are

64.7% of teachers who have utilized digital literacy in science subjects, and 27.1% use it for social studies lessons.

Apart from that, 1.4% of teachers use it in mathematics subjects, 0.5% in religious subjects, and 2.4% in arts and culture subjects. Meanwhile, others also answered that there were 0.5% of teachers who utilized digital literacy in almost all subjects. The teachers stated that the choice of using digital literacy media depended on the subject matter and the students' lesson hours. There are also teachers who state that all subjects use or make use of digital media, look at it and adapt it to the material that will be delivered to students.

Table 6. Funding Teachers Receive for Using Digital Literacy (n=207)

Funding Teachers Receive for Using Digital Literacy	Yes		No		Total
	F	%	F	%	
Government	61	29.5%	146	70.5%	207/100%
School	79	38.2%	128	61.8%	207/100%
School committee	3	1.4%	204	98.6%	207/100%
Out-of-pocket expenses	62	30%	145	70%	207/100%
Corporate Social Responsibility	0	0%	207	100%	207/100%

Source: Primary data

The funding that teachers receive to support the use of digital literacy during the learning process is usually generated from several parties, apart from independent costs. Table 6 shows that 29.5% of the funds came from the government and 38.2% of the funds came from individual schools. Meanwhile, 30% of the costs are incurred independently by teachers and 1.4% is obtained from the school committee.

This shows that the role of government is very important for the sustainability of education. Not only that, schools must also facilitate teaching needs and students' needs during the learning process in class. Meanwhile, teachers, as the parties closest to students, are accustomed to spending independent funds to support the acceleration of the learning process, especially in this digital era. Basically, the learning process is expected to always be able to keep up with current developments by adapting to the needs of teachers and students. Existing demands must be balanced with meeting learning needs, which is expected to speed up the learning process. With adequate facilities, it will be easier for students to participate in learning, with the hope that the learning process they have received so far will be useful and can be implemented in everyday life.

Table 7. Benefits of Digital Literacy for Teachers in Schools (n=207)

Benefits of Digital Literacy for Teachers in Schools	Yes		No		Total
	F	%	F	%	
Teachers have the ability to utilize digital media to improve teacher professionalism	69	33.3%	138	66.7%	207/100%
As an additional learning resource	24	11.6%	183	88.4%	207/100%
Digital technology-based learning media	5	2.4%	202	97.6%	207/100%
Supervision of students	2	1%	205	99%	207/100%
Easier to access information	4	1.9%	203	98.1%	207/100%
Publish works and information	0	0%	207	100%	207/100%
School promotion	0	0%	207	100%	207/100%
Open opportunities for teachers to be more productive such as creating digital teaching media	2	1%	205	99%	207/100%

Assist teachers in evaluating the learning process	1	0.5%	206	99.5%	207/100%

Source: Primary data

Discussion about digital literacy also means discussing the benefits obtained. As shown in Table 7, there are several benefits of using digital literacy as a learning medium that are felt by teachers in schools. Some of the benefits felt by teachers include; (1) As many as 33.3% of teachers stated that those who have the ability to utilize digital media can improve teacher professionalism. (2) As many as 11.6% of teachers stated that digital literacy was also useful as an additional learning resource. (3) As many as 2.4% of teachers felt that several subjects were made easier by the use of digital technology-based media. (4) 1% of teachers each stated that the benefits of using digital literacy in schools were that teachers found it easier to supervise students and opened up opportunities for teachers to be more productive, such as creating digital teaching media. (5) As many as 1.9% of teachers stated that it was easier to access information with the use of digital literacy. (6) As many as 0.5% stated that they could help teachers in evaluating the learning process.

Based on these results, the benefits that have the most influence on teachers in schools are increased teacher skills and professionalism and additional learning resources that are increasingly easily accessible to teachers. There are no schools or teachers in this case who use digital media to publish work and information or promote schools. This is in line with Li and Yu (2022) that, apart from meeting the demands of technological developments in the world of education, teachers' digital literacy levels, career satisfaction, and professional roles are significantly correlated with teachers' understanding and skills in using digital media.

Table 8. Benefits of Digital Literacy in Teachers' Fields (n=207)

Benefits of Digital Literacy in Teachers' Fields	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
To increase student enthusiasm or achievement	143	69.1%	64	30.9%	207/100%
To improve students' insight	39	18.8%	168	81.2%	207/100%
Provide a variety of learning methods to students	23	11.1%	184	88.9%	207/100%
To increase insight and provide varied learning media to students, and also so that they are not bored in learning	1	0.5%	206	99.5%	207/100%

Source: Primary data

The benefits of digital literacy can not only be felt by workers or certain organizations, but can also be felt primarily in the world of education. It is believed that the progress of a nation's civilization lies in the quality of life and its young generation. Therefore, as early as possible, children or students at school must be introduced to various learning methods that can accelerate the achievement of quality education goals. One way currently being taken is by taking advantage of technological developments in the digital era. As in Table 8, it is explained that the benefits of digital literacy used by teachers include increasing student enthusiasm and achievement. This was conveyed by almost 70% of teachers, namely 69.1% of research respondents. According to them, the use of digital literacy is very effective and is a special attraction for students in increasing their interest in learning. Not only that, the increased interest is directly proportional to the increase in students' academic achievements.

In addition, 18.8% of teachers stated that digital literacy was useful in broadening students' insight. As many as 11.1% of teachers also stated that the benefit of digital literacy in the fields they currently practice is to increase the variety of learning methods for students. Another benefit is increasing

insight and providing varied learning media to students, and also not making the learning process saturated and boring.

This study shows that the use of digital literacy for elementary school teachers is very useful in supporting a more creative and innovative learning process. In the future, more training or workshops on digital literacy are needed, especially in schools that still have limited use of digital media. Because, in reality in the field, digital literacy for teachers is able to meet the needs of future learning models, which are literate with contemporary technology. Several platforms that have been used also show the level of success of the learning development model and the ease of evaluating student work results.

In fact, the use of digital literacy does not only focus on certain subjects, although its use is still limited and mostly limited to one or two subjects. However, in the future, this digital media can be implemented in all subjects. For teachers in schools, the benefits that are felt to be most influential are the increase in teachers' abilities and professionalism and additional learning resources that become easier. To support the successful use of digital literacy, there needs to be supporting facilities from schools and the government.

Use of Digital Literacy and its Benefits for Elementary Students

This study found that the longest average time students had used digital literacy was two years ago, namely 39.6% of students used it (Table 9). Meanwhile, those who have only used it in the last year reached 20.8% of students. Meanwhile, 21.3% of students use digital literacy in the teaching and learning process for less than one year. Another 10.6% of students stated that they had used digital literacy in the last three years. Meanwhile, 2.9% of students stated that they had used digital literacy for more than the last five years. Meanwhile, there are also those who state that they have used digital literacy in various ways, there are those who state that in the last four or five years they may have used digital literacy when using or using technology, there are also those who state that they do not use digital literacy for one of reason, namely lack of school facilities and adequate infrastructure for students.

Table 9. Time Span of Elementary Students in Using Digital Literacy (n=207)

Time Span of Elementary Students in Using Digital Literacy	**F**	**%**
Less than one year	44	21.3%
One year ago	43	20.8%
Two years ago	82	39.6%
Three years ago	22	10.6%
Four years ago	2	1%
Five years ago	3	1.4%
More than five years ago	6	2.9%
Not using digital literacy due to limited infrastructure and inadequate school and student facilities	1	0.5%
It depends on the school's decision when primary school students can use digital literacy	1	0.5%
Doesn't know	1	0.5%
Not mentioned	1	0.5%
Total	**207**	**100%**

Source: Primary data

As was the case during the COVID-19 pandemic, the use of information technology or online learning is something new for some students. So, there are times when both students and teachers at school are not ready to use online learning applications. This also caused several respondents to state the

lack of adequate school facilities and infrastructure for students. Wasehudin and Anshori (2021) explained that the problem faced by schools during the pandemic at that time was that there were still many students who did not have adequate communication tools or internet access.

Several schools that have implemented the use of digital literacy-based learning media are making every effort to make its use accessible to their students. The media used by students to access digital literacy as shown in Table 10 include, 65.7% of students have used Google Classroom, and 19.8% of students have used YouTube, and there are also four (3%) who said they used Zoom Meeting. Apart from that, 5.8% said they used WhatsApp as a medium to access digital literacy, and 2.4% said they used the regional library website, and others said they used Instagram or email.

Table 10. Media Used by Elementary Students in Accessing Digital Literacy (n=207)

Media Used by Elementary Students in Accessing Digital Literacy	Yes		No		Total
	F	%	F	%	
Google Classroom	136	65.7%	71	34.3%	207/100%
Zoom Meeting	9	4.3%	198	95.7%	207/100%
YouTube	41	19.8%	166	80.2%	207/100%
Email	1	0.5%	206	99.5%	207/100%
WhatsApp	12	5.8%	195	94.2%	207/100%
Telegram	0	0%	207	100%	207/100%
Instagram	2	1%	205	99%	207/100%
Regional library website	5	2.4%	202	97.6%	207/100%

Source: Primary data

In the midst of increasing use of technology and developments in digital-based learning, all learning spaces are becoming easier in terms of access and use. The media used by students and the ones most dominantly used to support the teaching and learning process are Google Classroom and Zoom Meeting. Hilal and Hilal (2022) stated that, in supporting the use of digital literacy, Google Classroom shows more functions for the learning process compared to other platforms. Similar to teachers, students use the digital applications Google Classroom and Zoom Meeting more.

Table 11. Funding Elementary Students Receive for Using Digital Literacy (n=207)

Funding Elementary Students Receive for Using Digital Literacy	Yes		No		Total
	F	%	F	%	
School	87	42%	120	58%	207/100%
Parent	100	48.8%	107	51.2%	207/100%
Government	18	8.7%	189	91.3%	207/100%
Foundation	0	0%	207	100%	207/100%
School committee	3	1.4%	204	98.6%	207/100%
Corporate Social Responsibility	0	0%	207	100%	207/100%

Source: Primary data

Funding that students receive to support the use of digital literacy during the learning process usually comes from several parties, apart from parents. Table 11 shows that 42% of the funds came from individual schools and 8.7% of the funds came from the government. Meanwhile, 48.8% of the costs were paid independently by the students' parents and 1.4% came from the school committee. Of all

this funding, no funding has come from the school committee or cooperation from external parties in the form of CSR.

This shows that the role of schools and parents is very important for the continuity of education. Schools must also facilitate students' needs during the learning process in class, but must also be supported by each student's parents. Basically, the learning process is expected to always be able to keep up with developments in the digital era by adapting to student needs. Adequate facilities make it easier for students to participate in learning, with the hope that the learning process they have received so far will be useful and can be implemented in everyday life.

Primary School Students' Subject Areas that Make the Most of Digital Literacy	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
Science studies	139	67.1%	68	32.9%	207/100%
Maths	3	1.4%	204	98.6%	207/100%
Social science studies	51	24.6%	156	75.4%	207/100%
Religious studies	1	0.5%	206	99.5%	207/100%
Art studies	4	1.9%	203	98.1%	207/100%
Sport studies	0	0%	207	100%	207/100%
Bahasa Indonesia	1	0.5%	206	99.5%	207/100%
Civics, English	1	0.5%	206	99.5%	207/100%
All subjects	6	2.9%	201	97.1%	207/100%

Source: Primary data

Table 12 shows that there are at least two subjects which use digital media the most. As many as 67.1% of students have utilized digital literacy in science subjects, and 24.6% have used it for social studies subjects. Apart from that, 1.4% of students use it in mathematics subjects, 0.5% in religious subjects, and 1.9% in arts and culture subjects. Meanwhile, others also answered that there were 0.5% of teachers who utilized digital literacy in Indonesian, PKN and English subjects. As many as 2.9% of respondents stated that all subjects used or utilized digital media, viewed and adapted to the material presented to students.

Subjects that make greater use of digital literacy include science subjects. When compared with science subjects (67.1%), the use of digital literacy in social studies subjects is much lower (24.6%). In other subjects, there are also those who use digital literacy as a learning medium, although the numbers are only small. Prastiwi et al., (2021) found that, in relation to optimizing the use of digital platforms in Arabic language learning at the Al-Azhar Islamic Boarding School in Yogyakarta digital literacy was not only used in certain subjects, but also in Arabic language lessons. This means that the application of digital literacy-based learning has been widely used by teachers and students in various subjects.

Table 13 explains the use of digital literacy in an effort to help and improve elementary school students' achievement in learning. As many as 78.3% stated that digital literacy was able to help and improve elementary school student achievement. However, there were 11.6% who stated that digital literacy still had no impact on students due to a lack of support from the government, and there were 9.2% who stated that digital literacy still had no impact on students due to a lack of support from

schools. Another small percentage, namely 0.5%, stated that digital literacy was less able to have an impact on students due to a lack of supervision in its use.

Table 13. The Use of Digital Literacy to Help and Improve Elementary Students'Achievement in Learning (n=207)

The Use of Digital Literacy to Help and Improve Elementary Students' Achievement in Learning	**F**	**%**
Digital literacy can help and improve the achievement of elementary school students	162	78.3%
Digital literacy still has no impact on students due to lack of support from the government	24	11.6%
Digital literacy has not yet made an impact on students due to lack of support from schools	19	9.2%
Less able to have an impact on students due to lack of supervision in its use	1	0.5%
Total	**207**	**100%**

Source: Primary data

The use of digital literacy in an effort to help and improve elementary school students' achievement in learning can actually be considered successful. This supports List's (2019) study which states that students are required and must be introduced to a new understanding of digital literacy development (focus on autonomy, class project-based, and focus on technology) which can be integrated into learning continued in the literature.

Table 14. Benefits of Digital Literacy for Students (n=207)

Benefits of Digital Literacy for Students	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
Assists the distance learning process	130	62,8%	77	37,2%	207/100%
Improves students' ability to distinguish the correct learning sources	25	12.1%	182	87.9%	207/100%
Provides insight for students to search for reference sources independently	32	15.5%	175	84.5%	207/100%
Makes the learning atmosphere more interactive	8	3.9%	199	96.1%	207/100%
Promotes a positive reading culture that can be accessed anywhere and anytime	10	4.8%	197	95.2%	207/100%
Students do not benefit because school facilities are not maximized	1	0.5%	206	99.5%	207/100%

Source: Primary data

Table 14 shows that, apart from being beneficial for teachers, the use of digital media in learning is also beneficial for students. First, 62.8% stated they found it helped distance learning. As we all know, the world of education was faced with the acceleration of the distance learning model due to the COVID-19 pandemic. Because of this, the use of digital media has spread more quickly and is utilized by schools, teachers and students. Second, as many as 12.1% students stated that the benefit of digital literacy was that it could improve their ability to differentiate between correct learning sources.

Third, 15.5% stated that the benefit of digital literacy is that it can provide insight to search for reference sources independently. Fourth, as many as 3.9% answered that digital literacy was useful in creating a more interactive learning atmosphere. Fifth, there were 4.8% who stated that utilizing

digital literacy could increase a positive reading culture that could be accessed anywhere and at any time. Based on these results, the benefit that elementary school students feel is most influential at school is that digital literacy is considered to really help the distance learning process. However, a small number of them have not felt the benefits of using digital media at school, on the grounds that their schools have not provided optimal digital facilities.

Table 15. Reasons Elementary Students Utilize Digital Literacy (n=207)

Reasons Elementary Students Utilize Digital Literacy	Yes		No		Total
	F	%	F	%	
The teacher provides support	91	44%	116	56%	207/100%
Teachers are enthusiastic in teaching	27	13%	180	87%	207/100%
Patient teacher	3	1.4%	204	98.6%	207/100%
Innovative teacher	43	20.8%	164	79.2%	207/100%
The learning media used by teachers is more varied	40	19.3%	167	80.7%	207/100%
Because in maths, art and sports subjects usually require examples or tutorials, while teachers are limited in class time	1	0.5%	206	99.5%	207/100%

Source: Primary data

The reasons why elementary school students use digital literacy in the learning process are as shown in Table 15, namely 44% answered that they use digital literacy because there are teachers who provide support in learning using digital media. There were 13% who felt that, by using digital media, teachers became enthusiastic about teaching, and 20.8% of them stated that learning from teachers was more innovative. As many as 19.3% of elementary school students who utilize digital literacy felt that learning media has become more varied. There are also those who stated that the use of digital media in the teaching and learning process makes teachers more patient and able to maximize lesson time in class, such as in mathematics, arts and sports subjects.

As explained in this sub-chapter, the use of digital literacy for elementary school students is the same as its use for elementary school teachers, namely that it is equally beneficial for the continuity of the learning process by keeping up with current developments. However, while many elementary school students who live in rural areas still find it difficult to keep up with learning developments in the digital era, the majority of students have utilized digital platforms in the learning process which is supported by facilities independently from their parents and school. The real benefit that students experience with digital literacy is an increase in academic achievement, due to the ease of accessing literacy resources. Students also feel that learning in class has become more varied, because teachers provide good support in learning and always use contemporary methods that utilize digital media.

Availability of Facilities and School Efforts to Increase Digital Literacy for Elementary School Teachers and Students

The availability of facilities to increase the digital literacy of teachers and students in schools does not necessarily cover all parties. There are schools that do not even provide digital literacy facilities and there are also those that only provide partial facilities. In Table 16, it can be seen that 54.1% of the teachers who were respondents to this study stated that the school provides facilities for all teachers and all students. However, there were 18.8% who stated that the availability of digital literacy facilities at schools was only intended for teachers. There are also those who state that digital literacy facilities are only provided for students, this was conveyed by 3.4% of teachers.

Table 16. Availability of Facilities to Improve Digital Literacy of Teachers and Students in Schools (n=207)

Availability of Facilities to Improve Digital Literacy of Teachers and Students in Schools	**F**	**%**
The school provides facilities for all students and all teachers	112	54.1%
The school provides facilities for all teachers	39	18.8%
The school provides facilities for all students	7	3.4%
The school provides facilities for some teachers only	23	11.1%
The school provides facilities for some students only	7	3.4%
The school does not provide any facilities	18	8.7%
Total	**207**	**100%**

Source: Primary data

Meanwhile, on the other hand, there were 11.1% of teachers who stated that digital literacy facilities were available only for some teachers and 3.4% of teachers stated the opposite, digital literacy was only for some students. Meanwhile, 8.7% of teachers who were respondents to this study also stated that schools do not provide digital literacy facilities for both teachers and students. This shows that distribution of digital literacy facilities has not been fully implemented, in fact only 50% of the total availability of digital literacy facilities is felt by all teachers and students in schools.

Responding to the availability of digital literacy facilities in the school environment, schools are trying several ways to increase the use of digital literacy for teachers and students. As can be seen in Table 17, school efforts to increase the digital literacy of teachers and students are carried out by maximizing the following: First, 44% of teachers stated that the school provides special infrastructure related to digital literacy such as reading corners and libraries. According to them, this facility is good for increasing students' interest in reading and being sensitive to surrounding issues. Some schools provide special spots as spaces for students to read (Hempel-Jorgensen et al., 2018; Wandasari et al., 2019; Faidah & Maarif 2022; Sant 2023), with a more comfortable and open design. School library improvements are also considered effective in the current digital era. Such as providing reading materials that can be accessed online, updating old reading books, and making improvements to the layout and layout of the library.

Table 17. School Efforts to Improve Digital Literacy for Teachers and Students (n=207)

School Efforts to Improve Digital Literacy for Teachers and Students	**Yes**		**No**		**Total**
	F	**%**	**F**	**%**	
Schools provide special infrastructure related to digital literacy such as reading corners and libraries	91	44%	116	56%	207/100%
The school provides special facilities related to digital literacy such as WIFI, LCD projectors, speakers, etc.	78	37.7%	129	62.3%	207/100%
Provide various types of good reading resources to build a culture of literacy	16	7.7%	191	92.3%	207/100%
The school requires students to read a book 15 minutes before the learning activity begins	9	4.3%	198	95.7%	207/100%

The school conducts training on how to access student learning support resources through digital platforms	2	1%	205	99%	207/100%
The school cooperates with the government to get free access to books, videos and audio lessons	4	1.9%	203	98.1%	207/100%
Include teachers in workshops related to digital literacy	5	2.4%	202	97.6%	207/100%
The school provides support for teachers who participate in competitions related to digital literacy development	0	0%	207	100%	207/100%
Socialize the use of IT in learning to parents of students	0	0%	207	100%	207/100%
The school organizes competitions related to digital literacy such as quiz competitions, poetry writing, traditional games, and so on	1	0.5%	206	99.5%	207/100%

Source: Primary data

Second, 37.7% of teachers stated that in their school there were special facilities related to digital literacy such as WIFI, LCD projector, speakers, and so on. These supporting tools are very useful for teachers and students in supporting digital media-based learning. Not only are teachers required to be technologically literate, but students are also given a role to take part in similar matters. Third, 7.7% of teachers stated that one way to build students' awareness of technology literacy and digital literacy is to provide various types of good reading book sources to build students' literacy culture. Fourth, 4.3% of teachers said that at school students are required to read a book 15 minutes before learning activities begin. This is also a concrete step to build students' literacy awareness and culture.

Fifth, there were 1% and 1.9% of teachers who stated that efforts to increase digital literacy for teachers and students were carried out respectively by holding training regarding how to access student learning support resources through digital platforms, as well as collaborating with the government to get access to books, video and audio learning for free. Meanwhile, 0.5% of teachers stated that schools held competitions such as quizzes, poetry writing, traditional games, and so on, to support the use of digital literacy in schools. However, there has been no effort from schools to educate students' parents through socializing the use of technology in learning.

Thus, in the future, schools must also balance providing facilities and learning models not only for students, but also educating students' parents, so that the use of digital literacy can go both ways. Students receive a technology-literate learning model at school, while at home they can also be facilitated by their parents in using technology that is appropriate to learning needs.

Theoretically, the data findings from the study can be analyzed using Castells' network society theory. This theory is used to analyze technological developments used by humans. Nowadays, society is in the digital era, where the available electronic information and communication technology plays a very important role. This study found that digital literacy is used by elementary school teachers and students in rural Madura. Digital literacy is very useful and can improve student learning outcomes; students become more developed with digital literacy. Digital literacy in rural Madura is able to increase students' interest in studying the Social Sciences. In the past, students were less interested in studying social studies subjects, but, with digital literacy, students' interests have changed in a positive direction. The use of digital literacy is an effort to produce superior and innovative human resources in rural areas so that they are on par with students in urban areas.

Therefore, the use of digital literacy absolutely needs to be increased. This study shows that there are several efforts that can be made to increase the use of digital literacy in schools, including by developing learning media, supporting facilities and maximizing the use of digital media. Teachers can increase their knowledge and insight by taking training on digital literacy and then practicing it in classroom learning.

Digital media is used as a means of developing and transferring knowledge. As stated by Castells (2010), a network society can spread its activities beyond the historical boundaries of networks as a form of organization and social interaction. Castells (2010) stated that the internet is a fast and interactive communication medium. The added value of the internet through communication media is its ability to rejoin at a chosen time and process information quickly. This added value is important for recombination as a source of innovation, which is the root of educational productivity and cultural creativity.

CONCLUSIONS

The use of digital literacy for elementary school teachers and students, especially in rural Madura, is very beneficial for student development and learning outcomes. Efforts to increase students' interest in learning in order to produce superior human resources as per the fourth SDG development goal, can be achieved by utilizing digital media as a means of supporting contemporary learning. This study concludes that an effective way to increase the use of digital literacy in schools for teachers and students is to improve media-based learning support facilities, provide training or workshops on digital literacy, and maximize the use of digital media in all subjects. Teachers can increase and develop their own competencies by attending workshops on digital literacy, the results of which can be applied and implemented in the classroom during learning.

To produce quality human resources, students' interest in learning that has been nurtured from an early age is very important for the development of sustainable learning. Today's digital society is also a new environment for students to be wiser in using digital learning media. In other words, the key to a successful learning process for students is basically not only centered on teachers, but also requires support from parents, schools, communities and the government in providing adequate facilities which have been developed in accordance with technological developments.

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