Al-Ishlah: Jurnal Pendidikan
Vol.16, 3 (September, 2024), pp. 3227-3236
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v16i3.2875

Digital-Based Learning in Lagging Area: Students' Problems and Expectations

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ARTICLE INFO

Keywords:

Digital-Based Learning;
Student's Expectations;
Student's Problems

Article history:

Received 2022-10-31
Revised 2023-01-13
Accepted 2024-09-13

ABSTRACT

Digital-based learning required by the government since the COVID-19 pandemic in early 2020 until mid-2022 is not been fully implemented by teachers and students in lagging areas. Students face several problems and challenges in digital-based learning. This study aims to identify the causes of not implementing digital-based learning in the lagging area and analyze the expectations of students. This study was conducted by using quantitative methods. Data were obtained by administering questionnaires, conducting observations and interviews, and then analyzing and explaining narratively. The results of this study reveal that due to limited facilities and infrastructure, frequent power outages, and limited internet access, there are still many students who do not have laptops and smart devices and lack of responsibility, understanding and teacher skills are obstacles for students in utilizing digital media. Students expect the government's attention to improve facilities, improve the digital literacy of teachers and students, and improve teacher professionalism. In addition, they also want teachers to be more creative in carrying out classroom learning, such as using various digital media, learning videos, and various online learning technologies.

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1. INTRODUCTION

The outbreak of the COVID-19 pandemic in late 2019 triggered unprecedented fear and disruption worldwide, particularly in Indonesia (Kumar & Somani, 2020; Supriatna, 2020). To mitigate the spread of the virus, governments implemented various restrictions, including the closure of schools and the shift from traditional in-person learning to digital-based, remote education (Abumalloh et al., 2021; Onyema et al., 2020). While this rapid transition to online learning allowed educational activities to continue, it posed significant challenges, especially for students in lagging or underdeveloped areas. These regions often lack adequate infrastructure and resources for effective online education, leaving students to grapple with connectivity issues, limited access to devices, and insufficient support from educational institutions. As digital learning becomes a primary mode of instruction, it is crucial to explore the specific

problems and expectations of students in these disadvantaged areas. Understanding these challenges will help to formulate more inclusive and effective digital learning strategies that address the unique needs of students in remote and under-resourced regions.

According to Circular Letter No. 4 of 2020 regarding the Implementation of Education Policy during the COVID-19 Emergency (Susanti, 2020), students' right to education is upheld through the Learning from Home program. This was further reinforced by Circular Letter No. 15 of 2020, which outlined guidelines for remote learning. The Learning from Home program operates under several key principles: (1) Online/distance learning is designed to provide meaningful educational experiences without pressuring students to meet all curriculum objectives for grade promotion or graduation; (2) A focus on life skills education, including lessons about the COVID-19 pandemic, is encouraged; (3) Learning activities and tasks can be customized based on students' interests and circumstances, taking into account disparities in access to study resources at home; (4) Teachers are encouraged to provide qualitative feedback on students' work rather than assigning numerical grades (Pakpahan & Fitriani, 2020). This program has proven to be the most effective solution for maintaining education services during the COVID-19 crisis (Aryani et al., 2020).

Maria Van Kerkhove, an epidemiologist, emphasized that advancements in technology enable people to stay connected in various ways without the need for physical presence (Soronzen et al., 2020; Bjursel, 2020). This connectivity allows the teaching and learning process to continue through the use of information technology (Pakpahan & Fitriani, 2020). Online or distance learning leverages this technology to maintain educational standards, using computers or gadgets that link students and teachers, or students and lecturers, ensuring that the learning process can proceed effectively. The goal is that, despite the challenges posed by the COVID-19 pandemic, the integration of technology will facilitate the continuation of the teaching and learning process. The rapid increase in internet usage supports this transition, as Indonesia now has 175.4 million internet users out of a total population of approximately 272.1 million. This represents a 17 percent increase, or 25 million more users, compared to 2019 (Muharam et al., 2021).

Big Data is expanding rapidly, with global data generation projected to grow by 40% annually. Remarkably, 90% of the world's digital data has been generated in just the past two years (Al Nuami et al., 2015). Governments have started utilizing Big Data to enhance the quality of education, fostering a data-driven approach that informs decision-making and improves educational outcomes (Fischer et al., 2022; Eynon, 2013). With the rise of online learning, the use of digital technology in education has become increasingly widespread. Teachers and students now rely heavily on digital media, as more institutions implement digital-based learning, which integrates ICT into teaching activities. The integration of ICT in education shifts the focus from merely learning to use technology to using technology for learning. Digital-based learning can be either online or offline. In online learning, educators and students commonly use social media and internet-based applications equipped with chat, audio, and video conferencing features. Numerous online platforms, such as Google Classroom, Zoom, YouTube, and WhatsApp Groups, have been developed to support educational activities. Additionally, offline digital learning tools, such as educational videos and digital textbooks, do not require internet access. These tools play a crucial role in expanding access to learning resources and supporting education in diverse contexts.

Digital-based learning provides various advantages for both teachers and students (Dumford & Miller, 2018; Gilbert, 2015; Mukhtar et al., 2020). Digital-based learning both online and offline provides independent learning opportunities and high interaction between teachers and students (Swandi et al.,2021). In addition, learning will be more interesting, memorable, not monotonous and give enthusiasm to students in learning (Swandi et al.,2020). Thus, the use of digital learning media can improve students' memory skills, provide a more interesting learning experience where there are audio, video, text, and animation used to convey information or learning materials. With digital media too, teachers can adapt learning to students' learning styles, both auditory, visual, and kinesthetic.

In this era of rapid development of information and communication technology provides various advantages. The biggest benefit is time efficiency, which makes teachers and students feel comfortable.

They can reach material quickly from various available sources. Then it can decrease travel costs, school fees. Students can be independent in gaining knowledge, because they can find more information by using the internet. The use of ICT also makes it easier for students to get information quickly about the world of education and learning and can gain knowledge and experience that is not obtained in the classroom (Indria et al.,2021). The use of ICT also makes the work of teachers and students faster, teachers are able to more quickly arrange various assignments for students then students work faster, and send these assignments to be evaluated by the teacher. In addition, the integration of ICT into the learning process is also able to increase the ICT literacy index, build knowledge-based student characteristics, increase the effectiveness and efficiency of the learning process through improving the quality of learning outcomes and student activities. (Hernandez,2017). The success of a digital-based learning system is of course influenced by various components such as teachers, students, learning resources, and information and communication technology (advice and infrastructure) (Kurt, 2019; Romi, 2017).

According to Presidential Regulation No. 131 of 2015, West Halmahera is classified as an underdeveloped area. Data from the Directorate General of Development of Disadvantaged Regions, Ministry of Villages, Development of Disadvantaged Regions, and Transmigration (Directorate General of PDT, Kemendesa PDTT) also confirms that West Halmahera was still one of the 122 underdeveloped districts in Indonesia as of 2019. The Human Development Index (HDI) for West Halmahera in 2018 was 64.54, significantly lower than the national average of 71.39. Additionally, teacher distribution in the area is uneven, with a concentration in Jailolo, the district capital. The primary issue contributing to West Halmahera's underdevelopment is the low quality of human resources, especially in education (Priyono, 2020). A key factor is the lack of digital literacy and ICT skills among teachers (Purnamasari & Sadewo, 2021). Observations and surveys conducted in several schools reveal that (i) students' digital literacy is alarmingly low, (ii) both online and offline digital learning media are underutilized, and (iii) students have limited knowledge of computers and digital learning tools. Many students are unfamiliar with widely-used learning applications such as Zoom, Google Meet, and Google Classroom, and some are even unable to operate a computer or perform basic tasks like turning it on.

So far, not many references or previous studies have been found that examine digital-based learning in underdeveloped areas. Research conducted by the Pustekom Ministry of Education and Culture (2018) examined the development of an empowerment model that aims to develop the use of digital media among school operators and teachers in Papua and West Papua (Kusnandar, 2018). In this study, Pustekom first provided internet connection assistance and ICT devices in the form of computers, laptops and projectors. Then proceed with empowering its use at a distance. However, it was not explained how the results of the initial study were carried out and what digital-based learning was like in the Papua and West Papua regions before the implementation of the model was carried out. The application of remote assistance is also a weakness in this study. Whereas in Siahaan's research (2018) argued that in the outermost, outermost, underdeveloped, and border areas (3TP) the condition of schools in the 3TP areas in general not only faced unavailable infrastructure constraints but their human resources (HR) were also not ready to in addition to the availability of digital learning content and policy support (Pustekkom, 2012a). The findings of this study indicate that efforts to implement an ICT-integrated learning model are being initiated by various government bodies, including the Ministry of Education, to support teachers in 3TP areas. While these efforts have shown some progress, they have not yet reached their full potential.

Therefore, this study aims to explore the challenges faced by students across various schools in West Halmahera, not just a single institution. It also seeks to understand students' expectations for improving their knowledge and proficiency in science and technology. By focusing on students' perspectives on digital-based learning, this research provides valuable insights into their needs and challenges. The findings are intended to help government agencies better understand these issues and respond appropriately to enhance educational outcomes in the region.

2. METHODS

This study was conducted at a school in West Halmahera with a sample of 50 students. The research employed a quantitative descriptive approach, utilizing quantitative data to provide a detailed and comprehensive understanding of the subject. This method was chosen to explore the object of study thoroughly. The findings are presented narratively, based on data and information collected from the field (Indria et al., 2020). The data was processed and analyzed as a unified whole, following stages that included preliminary studies, fieldwork, and data analysis.

In the preliminary study, initial observations were carried out to explore the situation and build interaction with the resource persons or research samples. The results of scientific studies are written in notebooks and sheets. The questions required for the interview are also compiled during this stage. At the fieldwork stage, data was collected using a questionnaire, and then in-depth interviews were conducted directly with several students. Interviews were conducted to corroborate the results obtained in the questionnaire.

There are three classifications based on the results of data and information analysis, namely general description, problems, and expectations of students. This research is motivated by the problems faced by students in the application of digital-based learning both online and offline. For this reason, data were collected on the digital literacy index and the use of digital media in learning. Then, interviews were conducted about students' opinions, circumstances, joys and sorrows, impressions, requests, and expectations of students for learning. Raco suggests conducting in-depth and unstructured interviews to facilitate the process of obtaining information (Indria et al.,2021).

Although there are currently many studies on digital-based learning, this research is devoted to the 3T area, which has far more complex problems than other places. The findings in the study are expected to be the basis for policymakers to pay special attention to schools, teachers and students in the 3T area. Gambar dibawah ini adalah framework penelitian yang digunakan.

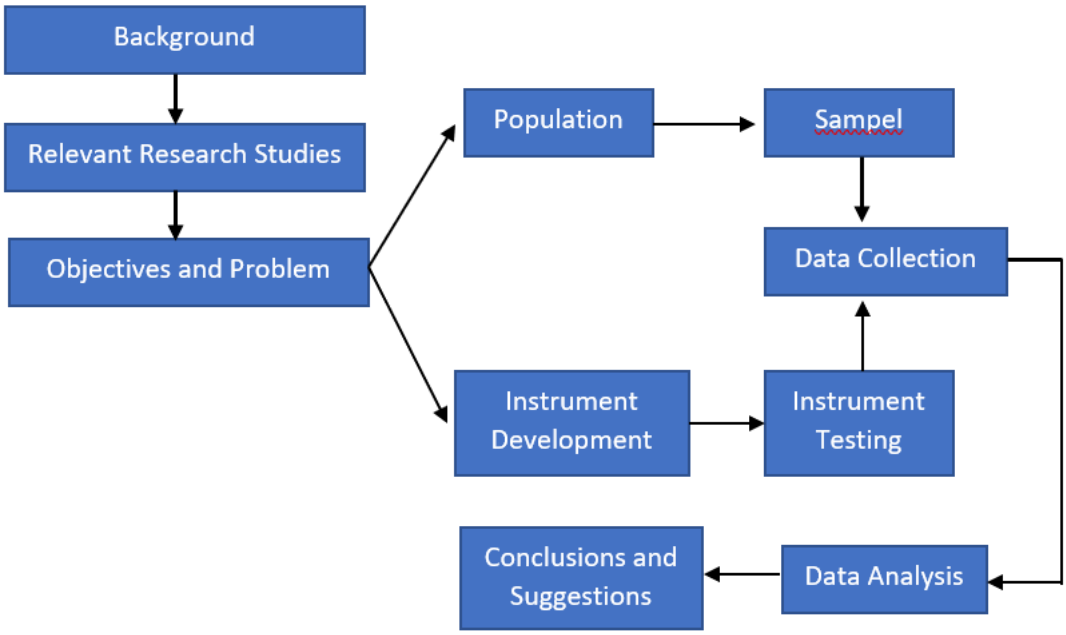

Figure 1. Research Flow Chart

3. FINDINGS AND DISCUSSION

3.1. Digital-Based Learning in the Lagging Area

Since May 2020, online digital learning has become widely adopted in response to the government's directive, issued through the Ministry of Education and Culture, aimed at curbing the spread of COVID-19. The government mandated all educational institutions to shift from traditional

face-to-face learning to an online format. This abrupt transition, however, occurred without sufficient planning or design. As a result, teachers had to quickly adapt and implement online learning methods with minimal preparation, experimenting with various strategies to find the most effective approach. Both teachers and students were compelled to quickly adjust to these changes, facing challenges related to mental, physical, and economic factors that affected their ability to cope with the new situation.

While numerous free digital applications are available for use in education, the majority of students do not utilize them. Table 1 provides an overview of the use of digital media in learning within the 3T region.

Table 1. Overview of ICT-Based Learning in the Lagging Area.

Aspect	Percentage (%)	Category
Ownership of ICT Equipment		
• Smartphone android	92	High
• Laptop	28	Low
• Ipad	0	Very Low
• Tab	4	Very Low
• Iphone	0	Very Low
Use of online learning platforms		
• Zoom	14	Very Low
• Google meet	0	Very Low
• WA Group	90	Very High
• LMS/E-learning	0	Very Low
• Website	12	Very Low
• Youtube (konten pembelajaran)	43	Moderate
Average Mastery in Using ICT		
• Zoom	27	Low
• Google meet	0	Very Low
• WA Group	98	Very High
• Email	45	Low
• Ms. Word	74	High
• Ms. Excel	43	Low
• Ms. Power point	51	Low

Table 1 reveals that the majority of students (92%) own smart devices, while 28% possess laptops. However, none of the students reported having tablets, iPads, or iPhones. Regarding the use of online learning platforms, 90% of students primarily use WhatsApp (WA) Groups, while only 14% utilize Zoom. For YouTube and learning websites, the usage rates are 43% and 12%, respectively. Notably, none of the students use Google Meet or Learning Management Systems (LMS). Additionally, Table 1 highlights students' proficiency levels with various ICT applications for learning purposes. The highest proficiency is observed in the use of WA Groups, while Microsoft applications fall within the "sufficient" category. In contrast, proficiency in Zoom and Google Meet is rated as low and very low, respectively.

Although applications such as Zoom, Google Meet, LMS, and YouTube have been widely utilized since 2020 (Oktavian & Aldya, 2020), the research findings indicate a stark contrast in the learning environment within 3T areas. To gain deeper insight into the challenges faced by students in these regions, researchers conducted interviews to explore the issues related to the use of these applications.

The Zoom application can be used for virtual meetings. Teachers and students can see each other and have live discussions remotely. That's why Zoom has become one of the most popular online media for running online classes. The application is also simple, so it can be installed on a smartphone. In the West Halmahera area, this application is more widely known by teachers and educational institutions to conduct zoom meetings, while in learning it is still very lacking. More than 80% of students stated that they had never used the application in learning. This is because most teachers never use this

application in learning. There are various reasons teachers do not use this application, such as requiring a large enough quota and an adequate internet network. Most teachers also don't know how to use Zoom.

Various applications, such as Moodle, Google Classroom, and Edmodo, offer Learning Management System (LMS) features that allow teachers to easily share well-organized learning materials and content. In addition to distributing materials, teachers can assign tasks with set deadlines and evaluate assignments and quizzes, with the results instantly shared with students. While schools in urban areas typically manage their own LMS, the situation in West Halmahera is quite different. Almost all teachers and students there are unfamiliar with LMS implementation. Despite the Ministry of Education and Culture launching an LMS to support schools and students in learning, teachers and students in Halmahera report that they have not received any socialization, guidance, or training on using the system.

WhatsApp, as a widely-used social media application, is primarily designed for text messaging, voice and video calls. It serves as a daily communication tool for people around the world. In education, teachers and students utilize WhatsApp to create groups for specific subjects, allowing teachers to share important academic information and learning materials. In West Halmahera, this app is also employed for group discussions related to assigned tasks. One of WhatsApp's key features is its ability to share various types of documents, including Microsoft Word files, PDFs, PowerPoint presentations, images, audio, videos, and website links. As a result, nearly every class, whether online or offline, forms a WhatsApp group. During the peak of the COVID-19 pandemic, WhatsApp Groups became the primary platform for online learning.

YouTube is another highly popular digital platform, allowing users to upload and watch videos. It is used globally, with millions of videos available across a variety of fields, including educational content. For students who prefer audio-visual learning, YouTube provides an accessible and user-friendly resource. It is frequently used in online learning as a valuable source of instructional videos. However, in the 3T areas, students tend to use YouTube more for entertainment than for educational purposes. Limited internet access is a major reason why students are less inclined to use YouTube for learning activities.

3.2. Student Complaints and Problems in Digital-Based Learning

Students have expressed various concerns regarding the use of digital-based learning media, both online and offline. A major issue is the high cost of internet data for online learning. Platforms that rely on audio-based communication and video conferencing consume significantly more data compared to watching YouTube videos for the same length of time. Many students, eager not to miss their online classes, are forced to frequently purchase more data. However, not all students come from families that can afford to consistently cover these costs. Asking their parents for money repeatedly is difficult, especially when parents are already facing their own financial struggles. The ongoing pandemic, which began in early 2020, has led to reduced income for many families, with some parents losing their jobs altogether. This economic hardship weighs heavily on both students and their parents. Consequently, many students become disengaged, often prioritizing other activities over participating in online learning.

The next complaint is still related to the internet. That's about the internet connection in West Halmahera which is still very difficult. Indonesia is a vast country with thousands of islands spread over thousands of kilometers, and it has not been able to achieve a good equal distribution of internet access in all regions. Evenly, especially in the 3T area where most of the students live in poor internet connection area are not available all the time. They have to go to a certain place to keep the signal well. Even some students have to cross the sea in order to get a better internet network. After finding a location that has a good internet network, they are required to focus on learning. Provide assignments and prepare to discuss with the teacher. This condition is exhausting both physically and mentally. Beside of that, electricity limitations also affect the use of ICT, of course all electronic equipment cannot

be used if it is not powered by electricity. The internet signal will be lost in various places if there is a power outage.

The third complaint is related to the skills and attitudes of teachers in learning. There are still many teachers who do not want to use good learning applications such as Zoom and Google Classroom. Most teachers want an easy application without paying attention to the quality of learning. WA Group is considered an easy learning application because they only send files or learning documents, give assignments, and ask students to submit assignments through the application. Many teachers do not control the online learning process. For example, not accompanying students during group discussions, so that when students have some questions to ask. An explanation from a teacher is something that students really hope for, especially when they are learning something difficult. Thus, they hope to get additional information from the teachers.

The problem also experienced by students is the availability of facilities and infrastructure. As presented in the table that, only 28% of students have laptops, or in other words, the majority of students do not have laptops. Actually, the limitations of this laptop can be overcome by the availability of a computer laboratory. However, most schools do not have adequate computer laboratories. Limited access to electricity also results in the use of computers in schools not being optimal. This also causes students' skills or mastery in using Microsoft Word, Excel and PowerPoint are still low.

3.3. Student Expectations

To create quality learning, the use of learning technology is mandatory. Various other research results suggest that teachers use digital-based learning models to create a learning atmosphere that is more interesting, make students more active, innovative, creative, effective, and not boring in order to improve student motivation (Swandi et al.,2021; Palloan et al.,2021). Various digital applications both online and offline can be used to support this model. Kuntarto (2017) states that digital applications have benefits that can help teachers increase the attractiveness of learning by reducing monotonous learning which is often experienced by students in the classroom.

As an illustration, teachers have used more conventional teaching styles from the past until now. The special feature of this teaching style is that the teacher gives explanations to students directly and students are only asked to listen to the explanations. In addition, they were also asked to take notes on the teacher's explanations and were more likely to receive one-way information. During such teaching and learning process, students rarely argue with the teacher/lecturer and they tend to say that they understand. This kind of learning is called a teacher center. However, due to technological developments, educators began to use several technologies to support the teaching and learning process such as the use of projectors to display some moving images and videos to improve students' understanding. Due to rapid technological advances, teachers have used several platforms and digital media that allow more interaction to occur so as to support an interactive teaching and learning process both in the classroom and outside the classroom.

On the other hand, the sophistication of information and communication technology that has been widely used by students and teachers is inversely proportional to the reality experienced by teaching staff and students in remote areas. After conducting a study of the causes of these problems, the research team also identified various student expectations so that there was an even distribution of education quality through the use of ICT. Various student expectations were conveyed such as providing laptops for schools to support the implementation of computer laboratory activities, providing internet quota/package assistance, providing training, technical guidance or workshops for teachers to be able to improve their digital literacy which was then implemented in the classroom.

The majority of students have not been able to use computers well, and only a small number are able to use Microsoft. In addition to personal laptop ownership which is still very low, the availability of laptops or school computers is also very low. Students hope that the government will provide computer assistance in schools so that students can use them interchangeably. With school computers that are proportional to the number of students, they can search for information, do assignments and

study in computer laboratories. Students also hope that schools have back up electricity. Frequent power outages disrupt learning. The geographical condition of West Halmahera which has a fairly high temperature, makes learning not conducive without a fan in the classroom.

Most students also hope that the quality of their teachers can be improved. They agree that, to improve the quality of learning and the outcomes produced by schools, the quality of teaching staff is paramount (Collins, 2015; Putra et al, 2021). In addition, the low digital literacy of teachers affects the quality of learning (Li, 2022). Students expect their teachers to master ICT not only as a medium of daily communication but also as a source of learning. Teachers are required to be able to develop various innovative digital learning media and integrate all types of technology in learning. Students also want teachers not to be indifferent in introducing technology to students and have to learn more in order to implement the knowledge and skills they have to students. Therefore, the role of various parties is needed in improving the quality and realizing professional teachers. This is in line with Winingsih's research which states that the local government, P4TK, and LPMP have an important role in creating professional teachers.

4. CONCLUSION

This study highlights the numerous challenges faced by students and educators in disadvantaged, remote, and underdeveloped areas, particularly in integrating Information and Communication Technology (ICT) into education. These challenges, exacerbated by the Covid-19 pandemic, include limited internet access, electricity, and inadequate infrastructure. Additionally, the low level of digital literacy among teachers and lecturers in these areas further hampers the effective use of ICT in education. A major limitation of this research is its focus on identifying obstacles rather than exploring potential solutions in detail. Future research should focus on developing and testing strategies to enhance ICT accessibility and digital literacy in these regions, with an emphasis on improving educational outcomes through practical interventions tailored to the local context.

Acknowledgments: The authors would like to thank all parties who have been involved in this research. This research was funded collaboratively by Dikti Kemendikbudristek through the Matching Fund program through contract number 172/E1/KS.06.02/2022.

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