Technology integration in learning management: A post-pandemic phenomenological study in elementary schools

Muhammad Ilyas [a] *, Faculty of Teacher Training and Education, Universitas Cokroaminoto Palopo, Palopo, 91921, Indonesia https://orcid.org/0000-0002-0016-6380

Herwin Herwin [b], Universitas Negeri Yogyakarta, Faculty of Education, Yogyakarta, 55281, Indonesia https://orcid.org/0000-0002-8882-5087

Ma'rufi Ma'rufi [c], Universitas Cokroaminoto Palopo, Faculty of Teacher Training and Education, Palopo, 91921, Indonesia https://orcid.org/0000-0002-1379-3287

Aprilia Tina Lidyasari [d], Universitas Negeri Yogyakarta, Faculty of Education, Yogyakarta, 55281, Indonesia https://orcid.org/0000-0002-4925-1578

Augusto da Costa [e], Faculty of Teacher Training and Education, Instituto Superior Cristal, Dili, Timor Leste https://orcid.org/0000-0002-2150-2793

Abstract

The post-pandemic period in the education sector is marked by government policies to carry out face-to-face education processes in schools. This situation has the potential to show various changes in learning management in elementary schools, especially with the integration of technology. This study aims to analyse the integration of technology in learning management in elementary schools during the post-pandemic period. This study uses a qualitative approach to the type of phenomenology. The research subjects were elementary school teachers who had been selected through a convenience technique based on the availability of subjects in the field. Data were collected through interviews and documentation. Data were analysed using qualitative analysis through data condensation, data presentation, verification and drawing conclusions. The study's findings show that the integration of technology in learning management tends to decrease during the post-pandemic period. Some habits of using technology in learning during the pandemic are no longer applied during the pandemic. However, some uses of technology are still maintained, such as the use of the WhatsApp group application in the delivery of learning information and the use of mobile-based assessment applications in learning assessment.

Keywords: Technology integration, learning management, post-pandemic.

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* ADDRESS FOR CORRESPONDENCE: Muhammad Ilyas, Universitas Cokroaminoto Palopo, Faculty of Teacher Training and Education, Jalan Latammacelling No. 19, 91921, Palopo, Indonesia
  E-mail address: muhammadilyas@uncp.ac.id / Tel.: +6282193607965

1. Introduction

Since the COVID-19 pandemic ended, the pattern of life in the wider community could not completely abandon the habits as it was still a pandemic. This has also occurred in the education aspect. The end of the pandemic left several legacies in the habit of providing education. One of the things left behind at that time was the integration of technology in the implementation of education in educational institutions, in this case schools (Ambarwati et al., 2022; Herwin & Dahalan, 2022; Ningrum et al., 2022; Pokhrel & Chhetri, 2021). This has become an old habit/pattern that has the potential to be maintained in the future.

Entering the new normal era, the Government of Indonesia through the Minister of Education issued a new policy related to the implementation of education in Indonesia (Adawiyah et al., 2021; Rosmiati & Lestari, 2021). One of the policies issued is that the educational process has been allowed to be carried out face-to-face in schools (Shaleh & Anhusadar, 2021; Sit & Assingkily, 2020). However, the policy of implementing the learning process in schools through face-to-face learning is carried out conditionally, namely by following the health protocols for the purpose of mutual safety (Aly et al., 2020; Aswat et al., 2021).

Currently, the situation is generally categorised as a normal situation. This has an impact on the implementation of education in elementary schools that has been carried out face-to-face in schools. However, the question that arises is, Will this situation completely eliminate all the habits that were carried out during the last pandemic? This attracts attention because during the pandemic all learning management was carried out from home through the distance learning system with technology integration (Basilaia & Kvavadze, 2020; Nguyen, 2021; Wati & Yuniawatika, 2020; Yulia, 2020). The more advanced and developed forms of information technology are becoming very urgent to be applied in educational activities (Andewi & Pujiastuti, 2021; Dewanti & Sujarwo, 2021; Setyaningsih & Rahmawati, 2021). This is very important to prepare a generation that can adapt to future opposition.

The integration of technology in the implementation of education, especially at the elementary school level, has the potential to have a positive impact on learning that is effective, fun and involves students actively. Learning that is presented by utilising the function of technology that is recognised as very useful for making the learning process more effective (Anggraeny et al., 2020). The use of technology in learning has changed the paradigm of delivering subject matter to students (Elyas, 2018). An example of using technology in education is the use of computers, laptops, Internet networks and smartphones as sources or learning media for students, which is certainly not a new thing for Generation Z (Arribathi et al., 2021). Generation Z is the generation after Generation Y, defined as people born between the years 1995 and 2010. This means that students in that generation are already familiar with the use of technology in their daily activities (Purnomo et al., 2016).

The phenomenon in the field shows that currently the implementation of education has been carried out face-to-face in schools. This also applies to the level of education in elementary schools. The transition after more than 2 years of distance learning through online learning management and then returning to face-to-face at school certainly has the potential to pose challenges, for teachers, students and schools in general. The existence of this transition certainly has a lot of things adjusting and re-adapting to new habits. This situation certainly has an impact on the implementation of education and learning in schools, including the management aspect of classroom learning.

Several problems were found after learning was carried out face-to-face in schools, such that the learning process could not take place optimally, including learning motivation problems, limited time availability in accordance with government regulations and other problems (Rahmawati, 2022).

Furthermore, the problem of learning management is an issue that is still being investigated and refined to find the right management model after the transition from online distance learning to face-to-face learning in schools. At the time of distance learning, the learning process was very dependent on the integration of technology. However, the question that arises now is, How will the intensity of learning technology after government policies include teachers and students entering and meeting at school? This has prompted researchers to analyse more deeply the implementation of post-pandemic learning. This study aims to analyse the integration of technology in elementary school learning during the post-pandemic period.

2. Methods

2.1. Types of research

This study uses a qualitative research approach to the type of phenomenology. The phenomenon studied in this study is the integration of technology in learning in elementary schools after the pandemic. Moreover, this phenomenon describes according to the findings the application and position of technology in face-to-face learning in elementary schools.

2.2. Research subjects

The subjects in this study consist of teachers who teach at the elementary school level in Indonesia. In this study, the participants were grouped based on their working area, namely West, Central and East Indonesia. The subjects of this research are elementary school teachers who have a work experience of more than 5 years. Research subjects were selected by convenience (or opportunistic) sampling in accordance with the availability of informants in the field. The selection of this subject is based on a post-pandemic learning policy coordinated by the Government of Indonesia through the Minister of Education, so that this phenomenon is felt by all regions in Indonesia.

2.3. Data collection and analysis techniques

The data collection technique used in this study is interviews. Interviews were the main data collection method, supported by documentation techniques. Data from informant interviews and documentation from the field were analysed using qualitative analysis through data condensation, data presentation, verification and drawing conclusions. Triangulation was used to prove the validity of the data.

2.4. Ethical clearance

This research was approved by every informant. Information and consent were obtained by the researchers from all respondents prior to the interview process. Informants were informed that this research will only analyse facts related to the integration of technology in post-pandemic learning. The informants acknowledged that all data were for research purposes only and did not affect the teacher's personal career in the future. In addition, this study was not intended to evaluate the teacher's performance in learning. The names of the informants are kept confidential for research purposes; the identity of the informants also was kept confidentially to ensure their answers did not affect their profession as teachers.

3. Findings and Discussion

This study focused on the integration of technology in learning management in elementary schools during the post-pandemic period. The study focuses on three main themes, namely the integration of technology in lesson planning, learning implementation and learning evaluation. Each theme is explored based on information and findings obtained in the field. This is carried out with a view to finding the

sub-themes that underline the findings of this study. After obtaining the sub-themes, data were condensed to find the relationship between the sub-themes that were found.

The first focus is the integration of technology in lesson planning. In this theme, the study focuses on the planning carried out by teachers during post-pandemic learning. Ideally, teachers will always try to give their best in the learning process. One of the factors that can lead to successful learning is the maximum lesson plan made by the teacher beforehand. Through maximum planning, a teacher can determine what strategies are used so that learning objectives can be achieved. In addition, good planning can prevent learning failure. The research findings based on the themes of technology integration in learning planning are described in Table 1.

Table 1. Integration of technology in lesson planning

No	Sub-themes	Correlation between sub-themes
1	Lesson plans are back like before the pandemic. All learning materials and topics are selected based on the curriculum from the government. Preparations for the use of learning technology, such as during the pandemic, are no longer carried out.	The integration of technology in learning planning has decreased in the post-pandemic period. Lesson plans tend to be the same as lesson plans in the pre-pandemic period. As for the planned addition of technology integration, it is only occasional and minor. The technology platform, which was previously used to deliver learning materials, was not discontinued in the post-pandemic period, but its function was shifted to a medium for delivering information on learning activities that were more technical in nature.
2	Learning is planned while still incorporating the use of learning technology, such as animated images, videos of learning materials and other innovations. But this is only occasionally or not every time and the intensity tends to be minor.	
3	The integration of technology in learning planning tends to switch functions where previously during the pandemic technology was more widely used as a medium for delivering learning material, but after the pandemic technology was more planned as a medium of communication and delivery of information on learning activities from teachers to students or vice versa.	

Table 1 shows the study findings on the themes of technology integration in lesson planning during the post-pandemic period. These findings indicate that there is a considerable difference between lesson planning during the pandemic and post-pandemic periods. After the pandemic, the integration of technology in lesson planning tends not to be as serious a concern as it was during the pandemic. Teachers prefer a simpler way without considering the dominant use of technology in learning. Almost all learning is planned following the old way before the pandemic. The role of innovative technology is actually not abandoned, but its intensity is no longer dominant and tends to play a minor role.

Lesson planning is one indicator of the quality of a teacher. Professional teachers are those who are able to formulate learning plans effectively to achieve the learning objectives (Otaya et al., 2020). This is very important because it is a teacher's guide in carrying out learning activities (Tjabolo & Herwin, 2020; Wuryandani & Herwin, 2021). This means that all things related to the implementation of learning ideally start from good planning (Fouryza et al., 2019). Likewise, learning innovation should ideally be seriously planned. Before teaching, the teacher should prepare a good plan (Marjito, 2009). Using innovative media, modules and teaching materials (Senen et al., 2021; Sartono et al., 2022; Astuti et al., 2022; Sartono et al., 2022; Rahayu et al., 2022). It is also related to technology integration. Ideally, this technology integration should also appear from the beginning of planning. If, in this phase, the teacher

is not able to plan well, then the success of learning and the achievement of goals are potentially difficult to achieve.

The second focus discusses the presentation of learning in the post-pandemic period. The existence of a face-to-face learning policy in schools became the basis for researchers to examine more deeply the role of technology in learning during this period. This focus was approached through direct interviews with informants and the study of relevant documents that could support the findings. The findings on this focus are described in Table 2.

Table 2. Integration of technology in the presentation of learning

No	Sub-themes	Correlation between sub-themes
1	Learning is carried out in a conventional and classical way by utilising the question-and-answer method, assignments and discussions and everything is carried out face-to-face like normal times before the pandemic.	The presentation of learning has undergone many changes. The application of platforms that have distance learning nuances has been abandoned, such as online meeting platforms. All meetings return to the old way through face-to-face learning in the classroom. Several habits related to technology integration, such as the use of online videos, animations, digital modules to WhatsApp group-based learning management, are still maintained in the post-pandemic period.
2	There is a change in the presentation of learning, which initially relied a lot on online meetings (Zoom, Google Meet, Google Classroom and other online platforms) to offline meetings. However, there are still presentation habits in distance learning that are maintained, such as the use of WhatsApp groups in the management of learning presentations.	
3	Most of the teaching presentation habits during the pandemic have been abandoned. However, the integration of innovative learning media, such as online videos, animation media and digital modules, is still maintained for variations in the learning climate during the post-pandemic period.	

The study findings presented in Table 2 show that the integration of technology in the delivery of learning after the pandemic has ended and has undergone many changes. In the post-pandemic period, the integration of technology in the presentation of learning experiences has changed and tends to show a decreasing intensity. Government policies that direct the learning process to be carried out face-to-face in schools are welcomed by various groups such as parents, teachers and students, and even the general public. However, this condition seems to be the cause of the decline in technology integration in the presentation of learning. Presentation of learning has returned to the old way (before the pandemic) by relying a lot on traditional lectures, questions and answers and assignments. Meanwhile, the use of digital technology, such as digital and online platforms, has slowly begun to be abandoned.

Other findings show that although the integration of digital technology is slowly starting to decline in its application in the field, it does not mean that all habits during distance learning during the pandemic are abandoned altogether (completely). Some habits during the distance learning period seem to be maintained, such as the use of WhatsApp groups as a medium of communication and information

related to learning. This is an old habit (during the pandemic) that still persists in the post-pandemic period. This is shown in Figure 1.
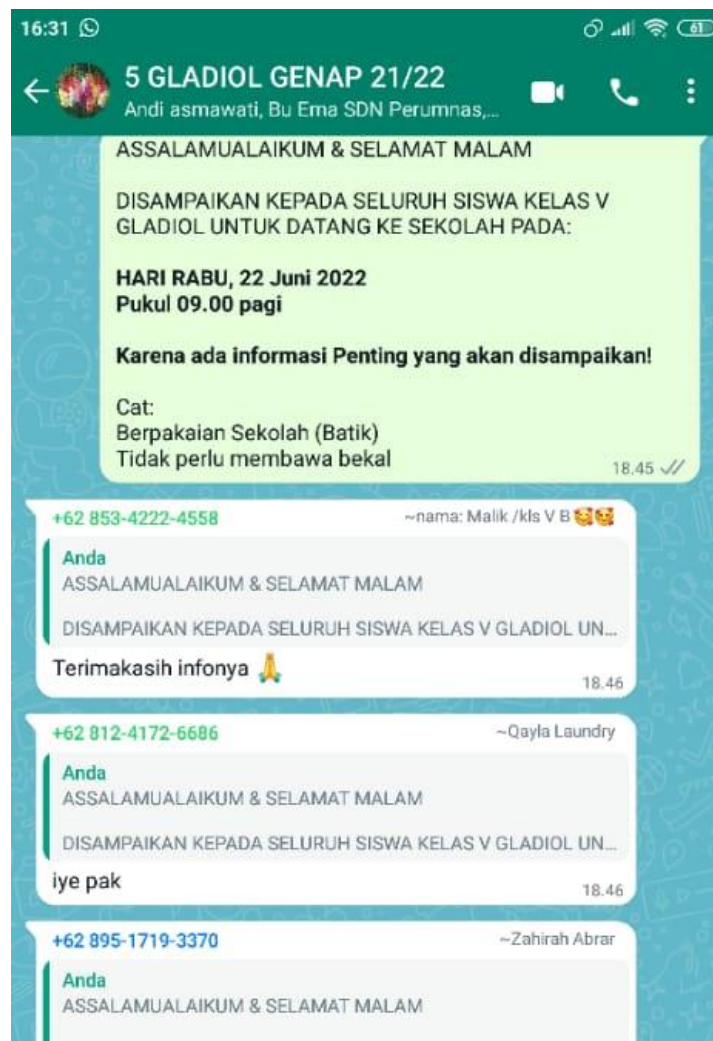

Figure 1. Utilisation of WhatsApp group as a medium of learning information

Figure 1 shows one of the old habits during the pandemic that is also maintained in the post-pandemic period. These findings are related to the integration of the WhatsApp group used in the delivery and presentation of learning media. This situation is supported by several previous findings which confirm that the current WhatsApp application tends to be well known to various groups including children (Herwin et al., 2021). Even today, almost all families have at least one WhatsApp account in their homes. Furthermore, the application is more practical and easy to run on a smartphone even at a low specification level (Barhoumi, 2015). This is the reason why the WhatsApp platform is still maintained as a medium of delivering learning in elementary schools during the post-pandemic period.

The third theme in this study is the integration of technology in learning evaluation. Evaluation is one part of learning management which has a very important role in the success of learning. One of the factors that trigger the quality of learning is influenced by the quality of learning evaluation. This theme

focuses on technology integration in the implementation of learning evaluation in the post-pandemic period. The research findings related to this theme are presented in Table 3.

Table 3. Integration of technology in the learning evaluation

No	Sub-themes	Correlation between sub-themes
1	Learning assessment management is back to normal as before the pandemic. The implementation of tests and exams during the post-pandemic uses a lot of paper and pencil tests. Assessment of attitudes and skills is carried out by observation and self-assessment.	The integration of technology in the implementation of the assessment has changed and tends to lead to a decrease in intensity. In the post-pandemic period, the reassessment is carried out
2	The implementation of the assessment is easier because the teacher and students can meet in one room. The habit during a pandemic that is maintained in terms of technology integration is the application of mobile assessment in learning assessment.	face-to-face by utilising direct assessment. However, the integration of technology that is still maintained from the habit during the pandemic is the use of mobile assessments in learning assessments.

Table 3 shows the findings on the integration of technology in learning assessment during the post-pandemic period. These findings generally reveal that the integration of technology in learning assessment in the post-pandemic period experienced a slight decrease in intensity. This is mostly triggered by the policy to return to learning activities through face-to-face learning at school. This situation has an impact on the implementation of assessments that do not take advantage of the dominant role of technology because teachers and students are already in the same room. Another factor that was found was that although technology integration experienced a slight decline, some habits of using technology were still maintained, such as the application of mobile assessments in learning.

Basically, the teacher's task in assessing learning is relatively heavy, but the presence of technology in learning can facilitate the teacher's task in terms of assessing the learning (Juanes & Ruisoto, 2018; Yuliani et al., 2020). With technology, teachers can easily collect and analyse assessment results. The findings of this study are relevant to previous findings which say that the use of mobile technology in learning assessment will improve the quality of the assessment carried out by teachers (Andrews et al., 2018; Dearnley et al., 2009; Hwang & Chang, 2011). Furthermore, mobile technology is recommended in the current learning activities (Park, 2011; Park et al., 2012). This is because various findings have proven that this mobile technology is very good for improving students' academic achievement in learning (Georgieva et al., 2011; Han & Shin, 2016).

In addition, the use of mobile phone technology in learning activities is very relevant to the conditions of today's society. Along with the development of technology, nowadays almost all active people already have a mobile phone in their family. Currently, mobile technology has been widely understood and used by people in various circles in Indonesia. Even its use is already familiar to the wider community. This means that this mobile phone technology can be operated by all circles, including children (Ally & Wark, 2018; Guri-Rosenblit, 2009; Peng et al., 2009). This is the basis why this technology

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is still maintained, even though the situation is no longer a pandemic status. The findings of the study on the use of mobile technology in the assessment of learning can be seen in Figure 2.

Figure 2. Utilisation of mobile phone technology in learning assessment

Figure 2 shows one of the uses of technology in learning assessment. Even though the pandemic situation has ended, the use of mobile phone applications in learning assessments is still being carried out. If we look at the findings shown in Figure 2, we will see that the mobile technology used by teachers is not only for the implementation of learning assessments, but it is also integrated with mobile games. This fits very well with the world of children, which is a subject in elementary school where the world of children is very closely related to the world of play (Herwin et al., 2022). This is very important because the quality of education is strongly influenced by the quality of the assessment (Herwin, 2022; Herwin et al., 2022). This is one of the reasons why this mobile assessment is still favoured by students in learning activities.

4. Conclusion

During the post-pandemic period, the integration of technology in learning planning in elementary schools had decreased in intensity. The use of learning technology, which was quite dominant during the pandemic, has decreased and is not even a thing that is seriously planned in the post-pandemic period. In the aspect of presenting learning habits, using online meetings and online platforms is no longer carried out. The presentation of learning has returned to the old way by utilising face-to-face meetings in the classroom. Some of the technological integrations that are still being maintained in the

post-pandemic period are the use of WhatsApp groups to assist in the communication and information related to learning that is still being used. In addition, in the aspect of learning assessment, technology integration still maintains the use of mobile phone applications in presenting learning assessment activities through mobile assessments.

The findings of this study generally indicate a decrease in the intensity of technology integration in learning management during the post-pandemic period. For this reason, it is recommended to re-strengthen the integration of technology in learning management, even though the learning process has been carried out face-to-face at school. The use of technological innovations, such as media and digital modules, is still very relevant to achieve effectiveness in learning. Teachers must be given confidence and trust with learning technology with more leverage in achieving goals. This requires support from various parties, especially policymakers, school principals and supervisors.

Education policymakers must provide facilities for teachers to improve their ability to integrate technology in learning activities. This can be carried out through providing career advancement opportunities, participating in training and other self-development activities. Learning management must remain integrated with modern technology because times will continue to evolve and life's challenges will continue to change. Therefore, teachers as educators must adapt to changes and advances in information and communication technology in general and educational technology in particular.

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