



Learning Technology on Early Childhood Education: The COVID-19 Pandemic Case

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Abstract

Purpose – This study aims to analyze the learning technology used by early childhood education teachers during the COVID-19 pandemic, this research describes the evaluation of learning technology used by teachers in early childhood education during the COVID-19 pandemic.

Design/methods/approach – The research method is quantitative research. Data was collected using a questionnaire method and strengthened by interviews to obtain in-depth data. Questionnaires were distributed to 30 institutions and early childhood education teachers in Serang District, Serang City, Banten Province. Interviews as reinforcing data were conducted using semi-structured interviews. The research sample was obtained through purposive random sampling. Conclusions were drawn from the data analysis process by using quantitative descriptive data analysis techniques.

Findings – Learning technology in early childhood education used by teachers of early childhood education institutions in Serang District, Serang City, Banten Province are whatsapp, zoom meeting, and youtube. Teachers can use learning technology for early childhood education optimally. However, the obstacles obtained consist of: signal interference, limited internet data, and limitations of parents assistance or guardians of students in having gadgets.

Research implications/limitations – This study has limitations on early childhood education learning in one area of Indonesia. The learning technology used by teachers also focuses on early childhood education. Therefore, higher education levels will have different learning technologies that teachers use.

Practical implications – This study implies that learning technology in early childhood education during the COVID-19 pandemic can use whatsapp, zoom meetings, and youtube.

Originality/value – This study contributes to the understanding in early childhood education teachers in utilizing learning technology such as whatsapp, zoom meeting, and youtube in carrying out the teaching and learning process during the COVID-19 pandemic.

Keywords: Learning technology; Early childhood education; COVID-19 pandemic

Paper type: Research paper

Introduction

The COVID-19 pandemic in Indonesia has not ended, with the discovery of cases of a new type of virus called omicron. This case was first announced in Indonesia on December 16, 2022, which has spread until now. This will certainly have an impact on closing schools, institutions, and study spaces (Pokhrel & Chhetri, 2021). The development of early childhood education institutions in Indonesia from year to year always increases, especially early childhood education institutions, both Playgroups and Kindergartens (Abdul Latif et al., 2021; Latif et al., 2020). This illustrates that the awareness of the Indonesian people in early childhood education is quite high. However, along with the COVID-19, several early childhood education institutions experienced a decrease in the number of students. The main factor was because early childhood education institutions were not ready to adjust the learning process (Abdul Latif et al., 2021).

The COVID-19 pandemic has changed the system of human life from various aspects from social activities, economics, to education. Various policies have been implemented to prevent the spread of the virus, such as: isolation, social distancing, physical distancing, wearing masks, and diligently washing hands. In addition, the online teaching policy in education in Indonesia has also begun to be implemented without exception for early childhood education institutions. The condition of COVID-19 requires teachers to make innovations or new breakthroughs to facilitate the learning process. One of the teaching policies is to do *online* learning by utilizing technology. During the COVID-19 pandemic, technology plays an important role in early childhood learning (Habibah et al., 2020; Nisa', 2020; Pakpahan & Fitriani, 2020; Salsabila et al., 2020).

Currently, learning is more directed at modernization activities with the help of technology. So that it can help early childhood in exploring their potential, interests, and talents interactively, productively, effectively, inspiringly, constructively, and fun. In addition, it is also expected to have simple life skills from the application of these technologies (Hardiyana et al., 2016). Moreover, the more advanced technological developments have an impact on the progress of the learning media in an educational institution (Habibah et al., 2020). Based on Munir's opinion, the presence of technology provides information quickly and makes it easier for teachers in the teaching and learning process. Moreover, learning is done online (Munir, 2009). A professional teacher must be wise and must have the ability to utilize and use learning technology during the COVID-19 pandemic.

Citing from the Ministerial Letter Number 15 of 2020 concerning Guidelines for the Emergency Period for the Spread of COVID-19 issued by the Ministry of Education and Culture Number 4 of 2020 concerning the Implementation of Educational Policies during the Emergency Period of Coronavirus Disease (COVID-19) that learning from home during the emergency spread of Coronavirus Disease (COVID-19) carried out while still paying attention to the COVID-19 handling protocol. Learning from home can be done through online and/or offline distance learning in accordance with the implementation guidelines (Kartawidjaja, 2020). One of the efforts in optimizing teachers must have the ability to utilize learning technology by attending seminars or training in learning activities in the digital era. So that teachers have an understanding of technology in order to be able to use various types of learning *platforms* on COVID-19 (Fujiawati et al., 2020). The teacher is a figure who occupies a position and plays an important role in education, as such: guiding and teaching (Rozalena & Kristiawan, 2017).

This is opposed with early childhood education institutions located in Serang District, Serang City, Banten Province, Indonesia. The lack of teacher ability in developing innovative media and parents' weak understanding of the use of technology are the main problems in teaching and learning activities in Serang District, Serang City, Banten Province (Observation, 2021). Therefore, this study focuses on what learning technology platforms used in early childhood education during the COVID-19 pandemic, evaluation of early childhood education learning technology used by teachers during the COVID-19 pandemic, and the problems experienced in using learning technology in education for early childhood during the COVID-19 pandemic in Serang District, Serang City, Banten Province.

Methods

This research method uses descriptive quantitative research. Data was collected using a questionnaire and strengthened by interviews. Questionnaires were distributed to 30 institutions and early childhood education teachers in Serang District, Serang City, Banten Province. Interviews as reinforcing data were conducted using semi-structured interviews. The research sample was obtained through purposive random sampling. Conclusions were drawn from the data analysis process using quantitative descriptive data analysis techniques (Louis et al., 2018).

Result and Analysis

Early Childhood Learning Platform during the COVID-19 Pandemic

Learning is an activity carried out between educators and students (Ihsana El, 2017; Munastiwi, 2019; Saefuddin & Berdiati, 2014). The pandemic period of early childhood learning is different from normal times. It is because, following the policy of the Ministry of Education and Culture that learning during the pandemic is carried out by learning from home. It is necessary to require a media to facilitate learning. The Early Childhood Education Institution in Serang District, Serang City, Banten Province is one of the institutions that implements early childhood learning from home. According to the data obtained from Early Childhood Education Institutions during the COVID-19 pandemic, there were platforms used to carry out learning in early childhood education, namely: Zoom Meeting, Whatsapp, and Youtube. The results of the questionnaire on the teacher's questionnaire for the Early Childhood Education Institute, Serang District, Serang City, Banten Province, obtained the following data:

Table 1. Zoom Meeting Platform for Early Childhood Education Learning During the COVID-19 Pandemic

	Frequency	Percent	Valid Percent	Cumulative percent
Not Utilizing	17	56.7	56.7	56.7
Already Utilizing	13	43.3	43.3	46.3
Total	30	100	100	100

Table 2. Whatsapp Platform for Early Childhood Education Learning during the COVID-19 Pandemic

	Frequency	Percent	Valid Percent	Cumulative percent
Not Utilizing	0	0	0	0
Already Utilizing	30	100	100	100
Total	30	100	100	100

Table 3. Youtube Learning Platform for Early Childhood Education during the COVID-19 Pandemic

	Frequency	Percent	Valid Percent	Cumulative percent
Not Utilizing	22	73.3	73.3	73.3
Already Utilizing	8	26.6	26.6	26.6
Total	30	100	100	100

Based on table 1, 2, and 3 it can be explained that teachers of early childhood education institutions in Serang District, Serang City, Banten Province mostly use the Whatsapp platform. However, teachers also use zoom meeting platforms and youtube. These results are also supported by the results of interviews with several teachers of early childhood education institutions in Serang District, Serang City, Banten Province that the most effective learning during a pandemic is using WhatsApp, because most parents or their representative already have WhatsApp. So that parents are not confused when accompanying their children to study at home (Interview, 2021).



Figure 1. Learning with Zoom Meeting



Figure 2. Learning with Whatsapp



Figure 3. Learning with Youtube

Evaluation of Learning Technology for Early Childhood Education during the COVID-19 Pandemic

Early childhood education learning platform in Serang District, Serang City, Banten Province during the COVID-19 pandemic using zoom meetings, whatsapp, and youtube. As the results of a questionnaire collected from 30 teachers of early childhood education institutions in Serang District, Serang City, Banten Province, the evaluation of early childhood education learning during the COVID-19 pandemic can be described as follows figure 4. Figure 4 explains that in general early childhood education teachers use learning technology optimally during the COVID-19 pandemic. However, there are some teachers who have not maximized the use of early childhood education learning technology during the COVID-19 pandemic

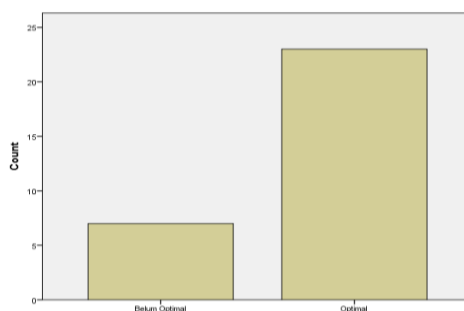


Figure 4. Evaluation of Learning Technology for Early Childhood Education during the COVID-19 Pandemic

Barriers to the Use of Learning Technology for Early Childhood Education during the COVID-19 Pandemic

Learning during the COVID-19 pandemic has changed the technical process of learning in every level of education, including early childhood education. Every learning does not always go well, especially during the pandemic learning that has just been implemented. Early childhood education institutions in Serang District, Serang City, Banten Province implement online learning by utilizing learning technology, namely: zoom meeting, whatsapp, and youtube. The obstacles when using learning technology in early childhood education during the COVID-19 pandemic are: signal interference, limited internet data, and limitations of parents or their representatives of students who have gadgets (Interview, 2021).

First, signal interference; as the results of interviews with teachers at early childhood education institutions in Serang District, Serang City, Banten Province explained that the signal was the main problem (Interview, 2021). It is because not all areas in Serang District, Banten Province have good signal. So that the learning material delivered by the teacher becomes constrained and sometimes the teacher repeats to explain the material.

Second, limited quota; as the interview results explain that internet data also has an important role in online learning (Interview, 2021). Online learning during the COVID-19 pandemic has required parents to spend money to buy internet data. The internet data required for each learning meeting is quite high, at least one gigabyte. If every day learning is done online, then in a week parents or their representatives need to prepare six gigabytes. Even though not all parents or their representatives have a good economy. They also need to fulfill their daily lives due to the impact of the COVID-19 pandemic.

Third, the limitations of parents or their representatives who have gadgets. Gadgets for online learning in childhood education must be owned by parents or their representatives. Based on the results of interviews with teachers at early childhood education institutions in Serang District, Serang City, Banten Province, they explained that not all families have many gadgets, especially if a family has more than two elementary school and kindergarten children (Interview, 2021). They have to learn alternately, so it is causing delays in understanding the material delivered by the teacher.

Discussion

The concept of online learning for early childhood education, especially in the Serang District, is using learning technology. Based on the results of the study, early childhood education learning in Serang District, Serang City, Banten Province during the COVID-19 pandemic was carried out online by utilizing learning technology in the form of whatsapp, zoom meeting, and youtube. In addition, educators also continue to use book references that have been determined according to the theme at school. However, early childhood education teachers institutions in Serang District use learning technology optimally. There are several efforts that can optimize learning activities from home (online learning) for early childhood during the current pandemic, those are: the ability of early childhood educators in using various media to support learning activities from home (online learning), as well as support from parents for the implementation of learning activities

from home (Raharja et al., 2021). Moreover, as previous research explained that the generation of children born in the world of information and communication technology, they have used and interacted before they went to school (Kayode & Olaronke, 2014).

Technological media in early childhood learning can be (a) Visual media which uses the child's sense of sight. (b) Audio media is a type of media that involves the sense of hearing when learning to use media takes place and the information received can be in verbal or non-verbal messages, verbal messages can be verbal while non-verbal messages can be sounds. (c) Media-Audiovisual is a type of media that involves two senses at the same time; the sense of sight and the sense of hearing in one activity. (d) Multimedia Media, called media which in one learning activity involves several types of media and equipment (Salsabila et al., 2020). Learning technology in the way children learn is conditionally influenced by age, experience, time required to use technology, and gender. In early childhood education experience is an important thing to learn. Moreover, learning in early childhood during the COVID-19 pandemic requires children to learn by using zoom meetings, whatsapp, and youtube (Nisa', 2020).

The findings of this study are in line with the research of Fujiwati et al. that the COVID - 19 pandemic has had a huge impact on the education sector. Therefore, learning from home or online learning is an alternative learning choice from early childhood education to tertiary education. The most optimal use of learning technology by early childhood education teachers during the COVID -19 pandemic is by using the WhatsApp application. The learning materials are conveyed to parents or their representative via *whatsapp group* then parents or their representative of students accompanying children to learn (Fujiwati et al., 2020).

The above findings are also strengthened by the issuance of Ministerial letter Number 15 of 2020 where there are strategies that can be carried out in carrying out learning from home or online, those are: (a) utilizing devices or workstations through several internet learning applications, (b) administration systems/ (disconnected), using TV, radio, module reviews and free worksheets, picture media, and media retrieval of objects in the general environment. Furthermore, the task of the teacher in regulating the internet learning process is as follows: (a) communication with the student's representative, (b) compiling an illustration plan of learning according to the child's wishes, (c) monitoring with educators in planning sample lesson plans, (d) ensuring the learning system running as expected, (e) consistently giving assignments to students, and (f) collecting and checking assignments that have been collected.

Yusnaini argues that distance learning is divided into three types, those are (a) distance learning practice, especially online learning practice, (b) E-learning is an electronic method used in learning systems, (c) web-based learning (Yanti & Yusnaini, 2018). During COVID-19, students are required to carry out learning activities from home via online. Learning activities are carried out online with the aim of deciding the spread of COVID-19. Therefore, it is necessary to use optimal technology so that online learning can be effective and on target. Therefore, as early childhood education teachers in the digital era, have to pay attention to several things, such as: (a) Teachers must be able and quickly adapt to learning technology, such as whatsapp and zoom meetings; (b) Early childhood education teachers are required to be creative and innovative, for example: making work at home such as making pots from plastic bottles; (c) Early childhood education teachers have to have good communication skills with parents, because this is very important in helping the learning process at home well (Pramana, 2020).

According to the findings of the research, teachers of early childhood education institutions in Serang District, Serang City, Banten Province utilize learning technology optimally. Teachers mostly use WhatsApp to do online learning in early childhood education. Zoom meetings or YouTube are rarely used. It is because parents or their representatives of early childhood education institutions in Serang District, Serang City, Banten Province are more familiar with WhatsApp. The research findings are also strengthened by several studies which explain that learning in early childhood education during the pandemic can use whatsapp, zoom meetings, and youtube (Aprianti & Sugito, 2022; Safriyani et al., 2021). In online learning, early childhood education does not always go well. The research findings explain that the obstacles faced by early childhood education teachers in Serang District, Serang City, Banten Province are signal

interference, limited internet data and limitations of gadgets. This finding is also in line with previous research that signals, internet data, and gadgets are must have stuff when carrying out learning, especially in early childhood education (Agustin et al., 2021; Agustina et al., 2021; Mufaziah & Yanti Fauziah, 2021).

Conclusion

Early childhood education learning during the COVID-19 pandemic is different from learning that takes place under normal situations. Early childhood education learning during the COVID-19 pandemic, teachers of early childhood education institutions in Serang District, Serang City, Banten Province use learning technology such as whatsapp, zoom meeting, and youtube. Teachers in these areas can use learning technology, especially on WhatsApp optimally. The obstacles experienced in implementing learning technology in early childhood education during the COVID-19 pandemic include: signal interference, limited internet data and limitations of parents or their representatives who have gadgets.

Declarations

Author contribution statement

Nurul Fazriah Rifai conceived the presented idea. Ibrahim Emilly Nzunda developed the theory of learning technology. Ratih Kusumawardani and Atin Fatimah the analytical methods. All authors discussed the result and contributed to the final manuscript.

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Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.


Declaration of interests statement


The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.


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