








# The Use of Technology in Indonesian K-6 Education during Covid-19 Pandemic: A Review

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**Keywords:** Online Learning, Covid-19, Early Childhood, Primary School, Indonesia.


**Abstract:** The Covid-19 outbreak suddenly forces all on-site classroom activities to be moved online, as the physical distance is strongly encouraged to curb the spread of the virus. This unexpected shift creates challenges and problems for both teachers and students in Indonesia, as they were not used to conducting these classroom activities online. For K-6 students (early childhood and primary school), it becomes even more difficult. Students are easily distracted and need to be supervised by their parents when using technology in a digital learning environment. Therefore, this study focuses on Indonesian K-6 education to show how recent progress has been made in adopting online learning. More specifically, based on a literature review, this study aims to shed light on the use of technology in teaching-learning processes in preschool and elementary education in Indonesia during the Covid-19 pandemic. Furthermore, the findings of this review study present a better understanding of the opportunities and challenges for future online learning in Indonesian K-6 education.


## 1 INTRODUCTION


The covid-19 pandemic has drastically changed how people live for more than one year. Even though some solutions are available and practical in many sectors like the workplace and industry, there is still no viable solution for education in rural areas of Indonesia where the teachers and the students are not familiar with the technology. Due to the pandemic, they are forced to use technology and that can be challenging, especially for K-6 education (early childhood and


primary school). Indonesia has about 577.305.660 students from early childhood to high school that can be affected by the pandemic (Nugroho, 2020). Many strategies have been applied to facilitate smooth knowledge transfer from teachers to students during the pandemic


Migrating to online learning is relatively easy for schools in large cities given that many of the students are familiar with technology (Senjaya et al., 2018). Online learning can be performed in two ways (Murad et al., 2020): synchronous and asynchronous.


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Synchronous means direct interaction between teacher and their students and it is typically performed via online meeting platforms such as Zoom, Google Meet, and Microsoft Teams. Asynchronous on the other hand means indirect interaction, which can be carried on from discussion forums, educational videos, and online assessments. However, this becomes more challenging in rural areas where most teaching activities are conducted face-to-face.

Many studies have summarized challenges and issues about migrating from face-to-face to online learning during the pandemic. However, they are focused on either higher education (Kamal et al., 2020; Wijanto et al., 2021), or countries other than Indonesia (Bao, 2020; Niemi and Kousa, 2020). Further, they typically cover only a few institutions in a particular area, which might not be sufficient to represent the whole country. To the best of our knowledge, no studies have summarized how K-6 education in Indonesia uses technology to facilitate online learning (both synchronous and asynchronous). This study addresses the issue by performing a literature review from academic papers. The collected papers are analyzed and discussed based on four points of view: use of software, use of hardware, activities, and benefits. It is expected to help Indonesian teachers or policymakers to expedite the transition from offline to online learning in rural areas of Indonesia.

## 2 METHOD

We derive a systematic literature review methodology (Kitchenham et al., 2010) to summarize papers about the impact of the Covid-19 pandemic on the learning activities of K-6 education. This research uses keywords to search relevant articles, inclusion and exclusion criteria, and data analysis.

Relevant papers are collected with the help of Google Scholar, a common academic search engine. To prioritize the most relevant papers, Boolean operators like OR and AND are used. The keywords are carefully tailored based on informal observation toward a small sample of relevant papers. The keywords are:

- a. "Indonesia" AND "Early Childhood" AND "information technology" AND "covid-19"
- b. "Indonesia" AND "PAUD" AND "teknologi" AND "covid-19"
- c. "Indonesia" AND "Primary School" AND "information technology" AND "covid-19"

- d. "Indonesia" AND "Sekolah Dasar" AND "teknologi" AND "covid-19"

All papers found from the given keywords are called “founded studies” (N = 32.310). After that, the papers are filtered based on their title and abstract. If both title and abstract align with our topic, the paper will be passed to the next pool called “candidate studies” (N = 392). Finally, all candidate studies papers are read in detail and passed to the last pool, “selected studies” if the content still aligns with our topic (N = 39). We have applied several inclusion and exclusion criteria:

- a. The papers should focus on empirical studies and literature review
- b. The papers should be about the use of technology during Covid-19
- c. The papers can be written in either English or Indonesia; not all relevant papers are written in English since our context is Indonesian education
- d. The papers should be published since 2020
- e. The papers should focus on Indonesian K-6 education (early childhood and primary school)
- f. If there are duplicates, only one of them is observed.

All papers in the “selected studies” are analyzed and the findings are summarized based on four points of view: software, hardware, activities, and benefits.

## 3 RESULT AND DISCUSSION

### 3.1 The Technologies Used during Covid-19

Based on the results of an analysis of 39 articles discussing the use of technology for K-6 education during the Covid-19 pandemic in Indonesia, 4 hardware and 44 software have been used to ensure the implementation of teaching and learning activities. An overview of technology during a pandemic is shown in Table 1 and Table 2.

#### 3.1.1 Early Childhood

Table 1 shows that laptops and smartphones are crucial hardware to facilitate online learning during the pandemic at the early childhood level. For those who have no access to such hardware devices, television (TV) can be another alternative to learn from home. There are a few educational TV programs provided by the government for that purpose.

Table 1: Major Technologies used in Early Childhood.

Type	Technology (21)	Authors
Hardware	Laptop (5)	Andrisyah & Ismiatun, 2021; Hidayati & Rudiyanto, 2021; Nurdin & Anhusadar, 2020; Nurkolis & Muhdi, 2020; Sholihatun et al., 2020
	Smartphone (9)	Abubakar & Sahriana, 2021; Andrisyah & Ismiatun, 2021; Fujiawati et al., 2020; Hidayati & Rudiyanto, 2021; Nurdin & Anhusadar, 2020; Nurkolis & Muhdi, 2020; Pudyastuti & Budiningsih, 2021; Sholihatun et al., 2020; Srihartini et al., 2020
	Television (3)	Fujiawati et al., 2020; Hidayati & Rudiyanto, 2021; Srihartini et al., 2020
Software	WhatsApp (16)	Abubakar & Sahriana, 2021; Andrisyah & Ismiatun, 2021; Arifiyanto et al., 2020; Firrdaus Zar'in, 2021; Fujiawati et al., 2020; Hidayati & Rudiyanto, 2021; Mariam et al., 2020; Nurdin & Anhusadar, 2020; Nurkolis & Muhdi, 2020; Pudyastuti & Budiningsih, 2021; Riadil et al., 2020; Sari, 2021; Shofa, 2020; Sholihatun et al., 2020; Srihartini et al., 2020; Sutrisno & Suhendro, 2020
	Zoom (8)	Andrisyah & Ismiatun, 2021; Fujiawati et al., 2020; Hidayati & Rudiyanto, 2021; Mariam et al., 2020; Nurdin & Anhusadar, 2020; Pudyastuti & Budiningsih, 2021; Sholihatun et al., 2020; Widiastuti et al., 2020
	YouTube (2)	Andrisyah & Ismiatun, 2021; Sholihatun et al., 2020
	Google Classroom (5)	Hidayati & Rudiyanto, 2021; Nurkolis & Muhdi, 2020; Shofa, 2020; Sholihatun et al., 2020; Widiastuti et al., 2020
	Google Suite for Education (1)	Hidayati & Rudiyanto, 2021
	Email (1)	Pudyastuti & Budiningsih, 2021
	Facebook (2)	Andrisyah & Ismiatun, 2021; Nurdin & Anhusadar, 2020
	Video Recording (1)	Abubakar & Sahriana, 2021
	Microsoft PowerPoint (3)	Andrisyah & Ismiatun, 2021; Insani et al., 2021; Mariam et al., 2020
	Multimedia Application (1)	Peniarsih & Paryanti, 2020
	Rumah Belajar (1)	Trisnadewi & Muliani, 2020
	Icando (1)	Trisnadewi & Muliani, 2020
	Moodle (1)	Rakhmawati et al., 2021
	Zenius (1)	Hidayati & Rudiyanto, 2021
Ruang Guru (1)	Hidayati & Rudiyanto, 2021	
Learning House (1)	Hidayati & Rudiyanto, 2021	
Google Meet (2)	Fujiawati et al., 2020; Nurdin & Anhusadar, 2020	

In addition, Table 1 shows that various software has been used to facilitate online learning during the pandemic at the early childhood level. The most common one is WhatsApp, a chatting application with simple and intuitive features. WhatsApp can be used to send learning materials and assessments in many forms including videos, photos, and recorded sound. The application's group video call is also useful to let the teacher interacts with the students. Other common software applications to facilitate social interaction are Zoom and Google Classroom. The former is used to do online meetings, replacing face-to-face meetings in the classroom. The latter is used to help the teacher designing a virtual environment for learning. Some early childhood teachers have utilized Microsoft PowerPoint, YouTube, Facebook, and Google Meet as alternative software applications to facilitate online learning during the pandemic. A few of them rely on email,

Moodle, Google Suite for Education, video recording, multimedia application for online learning, and other government-supported platforms (e.g., Ruang Guru, Rumah Belajar, Learning House, Zenius, and Icando).

### 3.1.2 Primary School

Learning media is a supporting instrument to deliver instructions or learning materials. This instrument is a combination of hardware and software technologies. Table 2 shows that during the pandemic, hardware devices like computers and mobile phones play a crucial role as part of the technology infrastructure in primary school education. Both computers and mobile phones in this micro-electronic era are combined and called a smartphone, a handheld computer. Its functional benefits, convenience, and affordable price make this

Table 2: Major Technologies used in Primary School.

Type	Technology (18)	Authors
Hardware	Smartphone (11)	Fauziyah, 2020; Gustria et al., 2021; Herlina & Suherman, 2020; Lestari & Gunawan, 2020; Pamungkas, 2020; Priatna & Rahman, 2021; Putra et al., 2020; Roesminingsih et al., 2020; Salsabila et al., 2020; Ulum & Sari et al., 2021; Umar & Nursalim, 2020
	Laptop (8)	Fauziyah, 2020; Herlina & Suherman, 2020; Pramana, 2021; Priatna & Rahman, 2021; Roesminingsih et al., 2020; Salsabila et al., 2020; Sari et al., 2021; Umar & Nursalim, 2020
	PC (4)	Herlina & Suherman, 2020; Putra et al., 2020; Sari et al., 2021; Umar & Nursalim, 2020
	Television (1)	Putra et al., 2020
	Whatsapp (14)	Afifah et al., 2021; Anugrahana, 2020; Astini, 2020; Dewi, 2020; Faridah & Suhandi, 2021; Fauziyah, 2020; Gustria et al., 2021; Lestari & Gunawan, 2020; Pramana, 2021; Priatna & Rahman, 2021; Putra et al., 2020; Salsabila et al., 2020; Sari et al., 2021; Umar & Nursalim, 2020
	Youtube (3)	Anugrahana, 2020; Pramana, 2021; Priatna & Rahman, 2021
	Zoom (10)	Afifah et al., 2021; Anugrahana, 2020; Astini, 2020; Dewi, 2020; Jamilah & Mulyadi, 2020; Lestari & Gunawan, 2020; Pramana, 2021; Roesminingsih et al., 2020; Ulum & Pamungkas, 2020; Umar & Nursalim, 2020
	Edmodo (2)	Faridah & Suhandi, 2021; Lestari & Gunawan, 2020
	Google Meet (3)	Roesminingsih et al., 2020; Salsabila et al., 2020; Ulum & Pamungkas, 2020
	Google Classroom (10)	Afifah et al., 2021; Anugrahana, 2020; Astini, 2020; Dewi, 2020; Fauziyah, 2020; Herlina & Suherman, 2020; Lestari & Gunawan, 2020; Roesminingsih et al., 2020; Salsabila et al., 2020; Umar & Nursalim, 2020
Software	Google Doc (2)	Astini, 2020; Herlina & Suherman, 2020
	Google Form (3)	Anugrahana, 2020; Astini, 2020; Herlina & Suherman, 2020
	Google Spreadsheet (1)	Herlina & Suherman, 2020
	Rumah Belajar (2)	Dewi, 2020; Lestari & Gunawan, 2020
	Video Convergence (5)	Afifah et al., 2021; Dewi, 2020; Fauziyah, 2020; Salsabila et al., 2020; Umar & Nursalim, 2020
	Moodle (1)	Lestari & Gunawan, 2020
	Email (1)	Lestari & Gunawan, 2020
	Meja Kita (1)	Lestari & Gunawan, 2020
	Icando (1)	Lestari & Gunawan, 2020
	Indonesian X (1)	Lestari & Gunawan, 2020
	Google for Education (1)	Lestari & Gunawan, 2020
	Kelas Pintar (1)	Lestari & Gunawan, 2020
	Microsoft Office 365 (1)	Lestari & Gunawan, 2020
	Quipper School (2)	Fauziyah, 2020; Lestari & Gunawan, 2020
	Ruang Guru (2)	Fauziyah, 2020; Lestari & Gunawan, 2020
	Sekolahmu (1)	Lestari & Gunawan, 2020
	Zenius (1)	Lestari & Gunawan, 2020
	Cisco Webex (2)	Lestari & Gunawan, 2020; Salsabila et al., 2020
Google Drive (1)	Anugrahana, 2020	
Tuweb (1)	Anugrahana, 2020	
Vlog (1)	Fauziyah, 2020	

hardware device popular. Most students and teachers have it as a medium for learning. Laptop is another crucial hardware to facilitate learning activities during the pandemic. However, not all teachers and students can afford to have it. This is why a laptop is less preferred as a medium for learning apart from

other reasons like less flexibility, less mobility, and expensive price, as shown in Table 2.

A few teachers and students cannot afford to buy either computer or a smartphone. Hence, the Indonesian government, via the Ministry of Education, Culture, Research and Technology

provides a few educational television programs. This is expected to deliver learning materials to students who study from home. Though it only facilitates one-way interaction, at least the learning materials can be delivered even without computers or smartphones. Further, it can work without an internet connection. Students are only required to watch the television programs and their teachers can issue paper-based assessments to them where the results should be submitted via mail or cargo.

In addition, hardware devices will not be useful without the counterpart, software applications. Each of those is a sequence of program instructions and data that makes the hardware working. Table 2 shows that there are many software applications used in Indonesian primary school education during the pandemic. This means that teachers and their institutions are quite selective in choosing which software applications that they will use in online learning. The software applications can be generally divided into three categories: synchronous applications, asynchronous applications, and learning management systems (LMS). Each of those has its designated learning output. According to Table 2, the most used software for online learning during the pandemic is WhatsApp, a messaging application. It is expected as teachers and students are familiar with it. They often use it for messaging, even before the pandemic. Learning materials, assessments, and learning feedback can be conveniently delivered. The application is also used for discussion on many occasions. Another common software to use is Zoom, an asynchronous application where teachers and students can communicate with one another virtually. Google Classroom is ranked third; it is a free LMS application. Some institutions encourage the use of Google Suite. Social media Moodle and LMS like Edmodo, Ruang Guru, and Zenius are also sometimes used. A few teachers use YouTube, Webex, and MS PowerPoint.

### 3.2 How Technologies Are Being Used during Covid-19

Based on the results of an analysis of 37 articles that discuss how technology is used to support teaching and learning activities for K-6 education during the COVID-19 pandemic in Indonesia, 5 activities have been carried out. An overview of technology-supported activities during the pandemic is shown in Table 3 and Table 4.

#### 3.2.1 Early Childhood

Table 3 depicts that from 21 articles covering technology used for early childhood education during the pandemic, there are five main activities. Distributing learning materials and conducting online learning are the two most crucial activities. Both activities have been facilitated by the use of technology. Interaction between teachers, students, and the students' guardians is another important activity. Communication is arguably crucial to fulfilling all learning objectives and that should not only focus on teachers and students. Teachers should also discuss the objectives with the students' guardians so that they can have a consensus about those and can help to mitigate any challenges that the students may face during the process.

Table 3: Activities with technology in Early Childhood.

Activity (19)	Authors
Conducting online learning (8)	Andrisyah & Ismiatun, 2021; Mariam et al., 2020; Nurdin & Anhusadar, 2020; Rakhmawati et al., 2021; Riadil et al., 2020; Shofa, 2020; Sholihatun et al., 2020; Trisnadewi & Muliiani, 2020
	Arifiyanto et al., 2020; Fujiawati et al., 2020; Hidayati & Rudiyanto, 2021; Peniarsih & Paryanti, 2020; Pudyastuti & Budiningsih, 2021; Sari, 2021; Suhendro, 2020; Sutrisno et al., 2021; Widiastuti et al., 2020;
Distributing learning materials and assessments (14)	Abubakar & Sahriana, 2021; Andrisyah & Ismiatun, 2021; Hidayati & Rudiyanto, 2021;
Communication between teachers, students, and the students' guardians (3)	Insani et al., 2021
Developing learning materials (1)	Sari, 2021
Media for discussion (1)	

Developing learning materials and performing discussion are two other common activities but they are rarer than the first three. This is expected since some teachers are not familiar with technology and learning that matters takes time. Though the whole learning process is online, it should still be aligned with students' pedagogical development. Further, it should be fun, meaningful, and useful to establish students' social skills. Hence, teachers need to



innovate in terms of developing learning materials or using appropriate technologies to make the students happy, interested, and engaged.

### 3.2.2 Primary School

Table 4 summarizes how technology supports online learning for primary schools during the pandemic. Teachers and students are expected to quickly familiarize themselves with technology, especially for tasks like distributing learning materials and assessments, online discussion, creating digital learning materials, and online communication between teachers, students, and even the students' guardians. The most common activity is distributing learning materials, followed by distributing the assessments, and online discussion. Though the use of technology in this internet era provides some convenience, teachers and students are expected to still improve their skills of using the technology, for more effective online learning.

### 3.3 The Main Benefits

Based on the results of an analysis of 34 articles that discuss the benefits of using technology for K-6 education during the COVID-19 pandemic in Indonesia, 9 benefits have been identified. An overview of the benefits of technology during a pandemic is shown in Table 5 and Table 6.

#### 3.3.1 Early Childhood

As shown in Table 5, there are eight benefits from online learning during the pandemic according to the literature. The most substantial benefit is the ability to manage and facilitate the whole learning process online. Without technology, online learning during the pandemic will not be effective. Technology facilitates teachers to do many activities, starting from planning, executing, to grading. Further, it also improves creativity to innovate, increases student enthusiasm, motivates teachers to familiarize themselves with technology, and facilitates convenient monitoring of student progress by both the teachers and the students' guardians. The pandemic implicitly motivates teachers to improve their skills in using technology as that is the only way to follow the current trend and improve the quality of education. All of them are required to keep student enthusiasm and engagement during online learning. This kind of benefit is also felt by the students' guardians as with technology, they can monitor the learning progress anytime and anywhere.

Table 4: Activities with technology in Primary School.

Activity (18)	Authors
Distributing learning materials and assessments (14)	Afifah et al., 2021; Anugrahana, 2020; Astini, 2020; Dewi, 2020; Faridah & Suhandi, 2021; Fauziyah, 2020; Herlina & Suherman, 2020; Gustria et al., 2021; Lestari & Gunawan, 2020; Pramana, 2021; Priatna & Rahman, 2021; Putra et al., 2020; Salsabila et al., 2020; Umar & Nursalim, 2020
Media for discussion (14)	Afifah et al., 2021; Anugrahana, 2020; Astini, 2020; Dewi, 2020; Fauziyah, 2020; Herlina & Suherman, 2020; Jamilah & Mulyadi, 2020; Lestari & Gunawan, 2020; Pamungkas, 2020; Pramana, 2021; Roesminingsih et al., 2020; Salsabila et al., 2020; Ulum & Putra et al., 2020; Umar & Nursalim, 2020
Conducting online learning (11)	Anugrahana, 2020; Dewi, 2020; Fauziyah, 2020; Herlina & Suherman, 2020; Jamilah & Mulyadi, 2020; Pramana, 2021; Priatna & Rahman, 2021; Putra et al., 2020; Roesminingsih et al., 2020; Sari et al., 2021; Ulum & Pamungkas, 2020
Communication between teachers, students, and the students' guardians (3)	Astini, 2020; Dewi, 2020; Priatna & Rahman, 2021

Improving teachers' skills of information technology, improving teachers to communicate with student's guardians, as well as encouraging the students' guardians to actively participate in the learning process are benefits with substantial effect. After one year of conducting online learning, there is an improvement of teachers' skills regarding information technology. Some teachers are capable of creating innovative, creative, and engaging educational videos. Managing the whole learning process via digital platforms has also become more common. Many stakeholders support improving teacher competency in using technology by conducting workshops like *pembaTIK* (Information Technology-based learning) held by Pusdatin Kemdikbud. In addition, online learning has encouraged the students' guardians to actively participate in succeeding the whole learning process

Table 5: Benefits of technology use in Early Childhood.

Benefit (21)	Authors	
Managing and facilitating the whole learning process online (11)	Abubakar & Sahriana, 2021; Arifiyanto et al., 2020; Hidayati & Rudiyanto, 2021; Nurdin & Anhusadar, 2020; Pudyastuti & Budiningsih, 2021; Rakhmawati et al., 2021; Riadil et al., 2020; Srihartini et al., 2020; Sutrisno et al., 2021; Suhendro, 2020; Trisnadewi & Muliani, 2020	
	Hidayati & Rudiyanto, 2021; Mariam et al., 2020; Shofa, 2020; Trisnadewi & Muliani, 2020	
	Nurkolis & Muhdi, 2020; Sholihatun et al., 2020; Widiastuti et al., 2020	
	Rakhmawati et al., 2021; Srihartini et al., 2020; Widiastuti et al., 2020	
	Mariam et al., 2020; Insani et al., 2021; Peniarsih & Paryanti, 2020	
	Sari, 2021	
	Rakhmawati et al., 2021	
	Andrisyah & Ismiatun, 2021; Fujiawati et al., 2020	
	Encouraging the students' guardians to actively participate in the learning process (1)	Rakhmawati et al., 2021
	Improving teacher competence in using technology (2)	Andrisyah & Ismiatun, 2021; Fujiawati et al., 2020
	Improving student enthusiasm (4)	Mariam et al., 2020; Insani et al., 2021; Peniarsih & Paryanti, 2020
Improving the frequency of communication between teachers and students' guardians (1)	Sari, 2021	
Motivating teachers to familiarize themselves with technology (3)	Nurkolis & Muhdi, 2020; Sholihatun et al., 2020; Widiastuti et al., 2020	
Convenient monitoring of student progress by both the teachers and the students' guardians (3)	Rakhmawati et al., 2021; Srihartini et al., 2020; Widiastuti et al., 2020	
Improving teachers' creativity (4)	Hidayati & Rudiyanto, 2021; Mariam et al., 2020; Shofa, 2020; Trisnadewi & Muliani, 2020	

### 3.3.2 Primary School

Table 6 depicts that there are some benefits from the use of technology in primary school during the pandemic. The most substantial one is managing and facilitating the whole learning process online. It is then followed by improving teachers' creativity to innovate the learning process and increasing the frequency of communication between teachers and students' guardians. Though it is not substantial, online learning motivates students to learn as long as teachers can engagingly deliver learning materials.

This also encourages the students' guardians to monitor student progress.

Table 6: Benefits of technology use in Primary School.

Benefit (13)	Authors
Make it easy to distribute learning materials (5)	Afifah et al., 2021; Astini, 2020; Pramana, 2021; Priatna & Rahman, 2021; Roesminingsih et al., 2020
Improving student enthusiasm (4)	Astini, 2020; Dewi, 2020; Faridah & Roesminingsih et al., 2020; Suhandi, 2021
Promoting more effective learning activities (4)	Anugrahana, 2020; Lestari & Gunawan, 2020; Roesminingsih et al., 2020; Salsabila et al., 2020
Improving teachers' creativity (1)	Jamilah & Mulyadi, 2020
Managing and facilitating the whole learning process online (3)	Afifah et al., 2021; Umar & Nursalim, 2020

## 4 CONCLUSION

In general, the study summarizes (i) how technology and the digital learning environment are pushed to their limits, highlighting both their benefits and drawbacks in Indonesian K-6 education during the pandemic via a systematic literature review, a technique to filter relevant information structurally and scientifically. For future work, the study can be replicated with larger coverage both at the educational level and on a multinational scale. (ii) Our study establishes that technology serves two primary functions in the teaching and learning process: first, as a medium of communication between educational stakeholders such as teachers, students, students' guardians, and policymakers, and second, as a tool for delivering learning materials (synchronously and asynchronously) and reflecting on the learning process. (iii) While the current use of technology is mainly focused on students' visual and auditory abilities (via laptops, smartphones, and television), there is still a dearth of research studies regarding how technology can be used to support students' motoric and kinetic abilities. This might be the limitation of existing technology or human capability while using or developing that technology. There are many opportunities for teachers, policymakers, and technology developers to collaborate in the future to maximize technology's potential for supporting technology-based learning. (iv) Additionally, this novel study demonstrates the

importance of conducting research on how digital competency model are needed for early childhood and primary school teachers, which competencies are required, and the depth to which these competencies must be mastered or perhaps supported by specialized IT personnel. Subsequent research can be about developing a framework for digital competency for early childhood and primary school teachers.

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