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Sanata Dharma University, Yogyakarta, Indonesia

# ISSUES AND CHALLENGES OF TECHNOLOGY USE IN INDONESIAN SCHOOLS: IMPLICATIONS FOR TEACHING AND LEARNING

**Yustinus Calvin Gai Mali[1*], Daniel Kurniawan[2], Josephine Ilona Januardi[3], Sanditya Jati Swara[4], Natalia Christy Emy Lokollo[5], Irma Amy Picauly[6], Nathasa Gracia Paramitha[7], Jose Argo Tanore[8], Meta Sekar Dewani[9], and Risdy Wijaya Pakiding[10]**

[1,2,3,4,5,6,7,8,9,10]Universitas Kristen Satya Wacana
calvin.yustinus@yahoo.com[1], daniel.kurniawan@uksw.edu[2],
josephineilonaj@gmail.com[3], work.sanditya@gmail.com[4],
nataliach.destiny@gmail.com[5], irmaamypic@gmail.com[6],
nathasagracia96@gmail.com[7], joseargods@gmail.com[8],
metasekard@gmail.com[9], and risdy.wijaya23@gmail.com[10]
*correspondence: calvin.yustinus@yahoo.com
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## Abstract

This paper mainly aims to explore issues and challenges in using technology to support teaching and learning in various schools located on three different islands in Indonesia, such as in Kalimantan, Nusa Tenggara, and Papua islands. The exploration was done through a holistic literature review of 30 national and local newspapers and online articles relevant to the aim of the study. We performed a peer-debriefing activity to present our review analysis to each other, comment on it, and made necessary revisions to our analysis to ensure the credibility of our review. While the results communicated various things, we could highlight some commonalities: unequal distribution of technology support or facilities in schools, creative ways to support teaching and learning practices regardless of the very minimum facilities that schools have, and continuous support from the Indonesian government and private sectors to improve school technology-supported facilities. We then discussed those commonalities in light of the relevant literature and their implications for teaching and learning to benefit school teachers or educational practitioners planning to teach in schools outside Java with minimal technological-related school facilities.

Keywords: English teaching and learning, teachers, technology

## Introduction

Technology or electronic tools, software, and hardware intertwined with the Internet used for teaching and learning (Cahyani & Cahyono, 2012; Mali & Timotius, 2018) has been playing an essential role in education worldwide.



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Computers and internet technology have been used daily to support students' and teachers' teaching and learning activities (Hafifah & Sulistyo, 2020). The Internet, interactive whiteboards, mobile devices, and computers have increasingly become integral and required components in the teaching and learning process (Richards, 2015). Inevitably, teachers are challenged to explore effective and various ways of integrating technology into their lessons and teaching practices. However, the types of technology tools that teachers have in their classrooms will influence their ability to integrate technology into their teaching and learning practices (Hamilton, 2018). For most schools that provide a satisfactory learning environment for using computers, technology is a necessary part of learning and might students' teaching and learning process (Li & Walsh, 2010). However, how about schools with very minimum technological facilities? In this study, we are interested in further exploring issues and challenges of technology use in Indonesian schools, especially in areas where access to a good internet connection, electricity, and various technological tools are still problematic for schools, teachers, and students. We want to see how teaching and learning practices are delivered to students despite minimum technological-related situations. This study hopes to provide clear realities of technology use in Indonesian schools and districts for teachers and practitioners planning to teach in schools with similar characteristics.

Literature has informed various issues and challenges about using technology to support teaching and learning. In Indonesia, technology facilities seem the become the most common issues that hinder teachers to integrate and fully maximize the potential of technology into their teaching and learning practices (for example, see Fauzan & Pimada, 2018; Hafifah & Sulistyo, 2020; Mali, 2017; Pujiharti et al., 2021; Purwaningsih et al., 2021; Syafrayani et al., 2022). Another issue is related to teachers' lack of training in using technology for teaching and learning purposes, as concerned by some previous researchers (e.g., Haryanto, 2021). This lack of training might be one of the possible reasons why many educators do not have the knowledge and abilities necessary to utilize computers, and they are not excited about integrating computers into their teaching methods (Eisenlauer, 2020). Other issues are related to teachers' unreadiness to move their face-to-face instructions to online delivery mode (Hidayat & Rozak, 2022) and time limitations in preparing learning materials with technology (Ja'ashan, 2020). In this study, we will explore if schools located on three different islands in Indonesia experience the same or different issues and challenges in using technology from those reported by the reviewed literature.

## Method

Our study aims to explore issues and challenges in using technology to support teaching and learning in various schools located on three different islands in Indonesia, such as Papua, Kalimantan, and Nusa Tenggara. To achieve this goal, we conducted a holistic literature review (i.e., similar to Li, 2012; Mali & Timotius, 2023) on national and local newspaper and online articles related to the aim of the study and the ones published in the last five years (i.e., 2023-2018).

In finding those articles, we used *Google News* (https://news.google.com/). Then, we typed several keywords, for example, *news Papua Indonesia school technology*, *Papua Indonesia education technology*, *realities of technology use in Papua*, and *the use of technology in Papua education*. Additionally, we visited the

*Google search engine* and some Indonesian news sites that offer articles in English, including *The Jakarta Post* (https://www.thejakartapost.com/), *Antara News* (https://en.antaranews.com/), and the *Conversations* (https://theconversation.com/id/in-english) where we also used similar keywords to find the related articles. We changed the word *Papua* in the keywords with *Kalimantan* and *Nusa Tenggara* to explore articles that discussed the issues happening in those two islands. Unrelated articles and the ones published before 2018 were excluded from our review. In total, we found 30 articles relevant to our study objective (for details, see Table 1).

We then worked in three different groups to review the articles we found. Group 1 (or authors 2-4) focused on Papua Island, Group 2 (or authors 5-7) focused on Kalimantan, and Group 3 (authors 8-10) focused on East Nusa Tenggara. We underlined all phrases or sentences that discussed any issues and challenges in using technology to support teaching and learning. We then created three different tables to put our review results that readers may access here https://drive.google.com/file/d/18AQy4JuiE06IKsraDERRr_1ju_yqCUFO/view?usp=share_link. We intentionally did not show the tables on this paper because of the word's limitations in the journal.

Table 1. The distribution of the newspaper articles reviewed in this paper

| No | Contexts | Authors | Newspaper/ Online Sources |
|---|---|---|---|
| 1 | Papua | Admin (2022) | West Papua Daily News Update |
| | Nabire | Cahya (2020) | The Jakarta Post |
| | Teluk Bintuni | Iswara and Cahya (2020) | The Jakarta Post |
| | Papua | Nasution (2021) | Antara News |
| | Mappi Regency | News Desk (2019) | The Jakarta Post |
| | Papua | Poluan and Hassan (2021) | The Conversation |
| | Papua | Putri (2022) | Digital Bisa |
| | Papua | Shofa (2022) | Jakarta Globe |
| | Papua | Sulaiman (2018) | The Jakarta Post |
| | West Papua | Utomo (2018) | The Jakarta Post |
| | West Papua | West Papua Content | West Papua Diary |
| 2 | West Kalimantan | Bachyul Jb (2017) | The Jakarta Post |
| | Central Kalimantan | Danuri, S (2022) | Radar Sampit Jawapos |
| | Balikpapan | Dian (2023) | Waspada |
| | West Kotawaringin | Disdikbud Kobar (2022) | Portal Berita Pemerintah Kabupaten Kotawaringin Barat |
| | Pontianak, West Kalimantan | El Fitra (2020) | The Jakarta Post |
| | Pontianak, West Kalimantan | Konten Media Partner | Kumparan |
| | Palangkaraya, Central Kalimantan | Mulang (2022) | Media Center Palangkaraya |
| | Pontianak, West Kalimantan | Oxtora (2022) | Antara News |
| | Tarakan, East Kalimantan | Redaksi (2021) | Antara News |
| | Palangkaraya, Central Kalimantan | Sugianto (2022) | Kalteng Tribun News |
| | West Kalimantan | Yusra (2023) | Daily Social ID |
| 3 | East Nusa Tenggara | Andraningtyas and Ad (2022) | Antara Indonesian News Agency |
| | East Nusa Tenggara | Andraningtyas and Yumma (2022) | Antara Indonesian News Agency |
| | East Nusa Tenggara | Anggoro (2021) | Medcom.id |

| | | |
|---|---|---|
| Nusa Alam School in Lombok | Heyward (2021) | The Jakarta Post |
| Santo Stanislaus junior high school in East Manggarai regency, East Nusa Tenggara | Makur (2020) | The Jakarta Post |
| Wolo Klibang village in West Adonara district, East Flores, East Nusa Tenggara | News Desk (2020) | The Jakarta Post |
| Kupang City, East Nusa Tenggara | Fernandez (2022) | VOI ID |
| Kecil Fatutasu elementary school, North Central Timor Regency, East Nusa Tenggara | Iswara and Cahya (2020) | The Jakarta Post |
| Batudulang village, Sumbawa regency, West Nusa Tenggara | Septia (2020) | Kompas.com |
| Folangkai public primary school on Alor Island in East Nusa Tenggara | Siregar (2020) | CNA |

To ensure the credibility of our review, we performed a peer debriefing technique similar to what was successfully done by previous researchers (e.g., Mali & Salsbury, 2021; Romios et al., 2020). All authors met face-to-face in a classroom, and each group presented their review results. While the members in each group were presenting, the others listened to the presentation and took notes on some points they were interested in clarifying further or commenting on. We could also ask questions to the presenters, and clarify ideas that the group presented. We then used all the feedback from our peers in that class to make necessary revisions to the review results we presented in this paper.

## Findings and Discussion

### *Findings*

We will present the results of our analysis in three different categories: Papua, Kalimantan, and Nusa Tenggara, to provide detailed descriptions of issues and challenges in the use of technology to support teaching and learning in schools located on each island. Afterwards, the results will be discussed in light of relevant literature. Importantly, readers should not generalize the findings presented in the following sections as they were only based on our review of 30 articles (see Table 1) covering only some schools in those three big islands in Indonesia.

### *Papua*

*Unequal distribution of quality education, also including technology support or facilities.* Utomo (2018) has highlighted different cultural responses from Papuans that might have not only widened the educational gap between Papua and other areas in Indonesia but also slowed any technology integration and educational advancements in Papua. Even the government has admitted the gap, including the higher education in Papua, as reported by Nasution (2021), leading to their low human development index. More particularly, a teacher has shared an open letter pleading with the minister to pay attention to schools in Papua because of the unequal and contrasting quality of education and mentioning that the area is not yet ready for technology-based education (News Desk, 2019). Geographical location, as well as the absence of infrastructure for teaching, including internet access, have been mentioned to be obstacles to education development in Papua (West Papua Content, 2022; Putri, 2022).

*Lack of readiness to face remote or digital learning, especially during the pandemic.* Admin (2022) has reported the difficulty faced in Papua when they

attempted to go through online learning during the COVID-19 pandemic. Different from some teachers' attempts in other areas in Indonesia, a teacher has been reported to still use printed modules during the pandemic due to the unequal distribution of technology in Papua (Iswara & Cahya, 2020). While TVRI, the Indonesia national television network, has attempted to create an educational program to help learners in their remote learning, the absence of learners' smartphones and reliable internet connection have hindered access to such a TV program. Poluan and Hassan (2021) and Admin (2022) have agreed to look on the bright side of the pandemic: it might boost the use of technology to support education in Papua.

*Support from the government or other private institutions to develop education and its technical support.* Electricity and internet access have become part of the effort from the Indonesian government to develop the education sector in Papua (West Papua Content, 2022). Sulaiman (2018) has mentioned e-learning among the eight education goals targeted by the government. In addition, Putri (2022) has reported that the Indonesian government has fully supported digital procurement and attempted to develop the teachers' teaching skills through a teacher capacity-building program. TVRI has also attempted to air *Belajar dari Rumah*, an educational program, to help learners get through online learning (Cahya, 2020). Shofa (2022) has mentioned Huawei and its commitment to helping Papua deal with the digital divide and technology talent gap by providing better net connection in Papua.

***Kalimantan***

*Lack of facilities provided in the regions.* Some regions in Kalimantan need better telecommunication networks. El Fitra (2020) and Oxtora (2022) reported that elementary school teachers even used radio broadcasts to reach their students in their homes during the pandemic. They mentioned that some areas are categorized as blank spots or areas with no internet connection or even electricity.

*Adapting to the use of technology, especially in schools.* The Indonesian government collaborates with many companies to train teachers in Kalimantan. In facing the digital era, several companies in Kalimantan are assisting schools in preparing the technology that could assist the students facing the new era of technology (Sugianto, 2022; Disdikbud Kobar, 2022; WaspadaID, 2023; Mulang, 2022). Companies such as mentioned by Konten Media Partner (2023), EPSON Indonesia provides schools with their products to enhance the use of technology in schools and *SekolahPro* with their learning management system that helps schools in providing the newest materials (Yusra, 2023). Moreover, one of the internet providers in Indonesia (Telkomsel) provides training for teachers and students in operating *Microsoft Office 365* (Redaksi, 2021) to face online learning since the pandemic.

*The presence of Indigenous schools.* In this era of modernization, indigenous schools do not utilize technology in their teaching and learning to preserve their tradition (Danuri, 2022; Bachyul, 2017). They carry out concepts of nature in their curriculum. Surprisingly, one of the indigenous schools is located in the same region as a public school in the digital transformation process, in West Kotaringin, Central Kalimantan.

***Nusa Tenggara***

*The need for adequate internet access and limited availability of technology-supporting devices.* Many places in Indonesia faced teaching and learning difficulties admits the Covid-19 pandemic. In Nusa Tenggara islands, students and teachers in remote places often study without an internet connection and the proper tools needed for online learning (News Desk, 2020). Thus, they must think creatively about how teaching and the learning process can happen effectively (Fernandez, 2022; Heyward, 2021). Moreover, Septia (2020) mentioned one of the tools they came up with is using a *handy talky* (henceforth called HT), and even though it is difficult for teachers to teach using HT, they still do it so their students can receive the study materials. Some other teachers have to travel far away to meet their students directly one by one at their homes so that they can deliver learning materials (Iswara & Cahya, 2020; Makur, 2020; Siregar, 2020).

*Indonesian government's initiatives to improve digital connectivity and talents in Nusa Tenggara.* The Indonesian government has significantly improved digital connectivity in Nusa Tenggara by building *Base Transceiver Station* (henceforth called BTS) and supporting digital talent development through various programs (Anggoro, 2021). The government also works to ensure that students and teachers in the region have access to the Internet and the resources needed to advance their skills in the field of digital technology (Andraningtyas & Yumna, 2022). These efforts are expected to positively impact the region's economic, educational, and social development. In short, the government intends to empower Nusa Tenggara to reach its full potential and be at the forefront of digital innovation in Indonesia by promoting a solid digital infrastructure and developing the skills of its people (Andraningtyas & Yumna, 2022).

***Discussion***

While the findings communicate various things, we would like to discuss three commonalities related to the issues and challenges of technology use for teaching and learning. First and foremost, in support of Butarbutar's (2023); Fauzan and Pimada's (2018); Habeahan et al.'s (2022) previous research findings, we spotted that lack of supporting technological facilities (i.e., related to the poor internet connection and electricity) were the main issues that hinder the full integration of technology in schools. Second, regardless of the unavailability of technological facilities, school teachers successfully found ways to deliver teaching and learning materials to their students. However, our review results are similar to those of Haryanto's (2021), that many Indonesian teachers still lack training in using technology for teaching and learning purposes. Third, we appreciate all the support both from the Indonesian government and the private sector to improve teaching and learning qualities in those three islands by initiating various educational programs to help learners learn remotely from their homes, offering a learning management system service that helps schools in providing and distributing learning materials to students and providing professional development programs for teachers.

These commonalities and what we found in our review became our starting point to discuss their implications for teaching and learning practices, which should benefit school teachers or educational practitioners planning to teach in schools outside Java with minimal school facilities. Teachers in this twenty-first century

should develop an adaptive or survival pedagogy to face different learning contexts, whether or not enough technological resources are available, and anticipate any uncontrolled conditions, such as pandemics or disasters. This has been highlighted by Butarbutar (2023) when reflecting on the online learning experience during the COVID-19 pandemic.

Second, the school teachers can strategically download videos or movies from the Internet before the class and invite their students to watch them together. If there is no signal, they can still use these videos or movies as a source of language learning inputs and discussion for their students. Through videos or movies, teachers can bring variety and flexibility to the language classroom by extending the range of teaching techniques and resources. The idea of using videos or movies is supported by a study by Otta (2021). He recommended that educators in East Nusa Tenggara create videos or tasks that motivate students to learn from various sources, such as books, newspapers, magazines, radio, or television.

Third, students' parental support and involvement are essential, which includes providing any necessary technology or tools. Therefore, school teachers should communicate effectively with parents to better support their children's learning. This was also proposed by Butarbutar (2023) when discussing digital reading and writing literacy for students.

Fourth, the school teachers can collaborate with local officials to ensure that public spaces, such as community centres or libraries have reliable internet access and are safe, accessible, and conducive to learning. Students can use these spaces to access the materials they need. The government of Indonesia has been investing in improving mobile and internet connectivity by deploying BTS in hundreds of villages in East Nusa Tenggara province (as reported by Anggoro, 2021).

Fifth, teachers' training programs in universities should also design courses that can prepare their students to be pedagogically and mentally ready to teach not only in schools in big cities with complete technology facilities and good internet connection but also in schools in areas where there is no internet connection or even electricity.

Last, we would like to emphasize that technical support and assistance from the government should always be available. One good practical example is when the Indonesian government provided phone/data credit to support distance learning during the COVID-19 pandemic (Adjie, 2020; The Jakarta Post, 2021). Effective online teaching and learning, for example, need a reliable internet connection, and therefore, schools must be ready with the necessary facilities. The collaboration among stakeholders should provide equal access to resources and opportunities for all students to learn with the best and wisest use of technology.

## Conclusions

This paper has reviewed 30 articles from various online sources to explore issues and challenges in using technology to support teaching and learning in various schools located on three islands in Indonesia, such as Papua, Kalimantan, and Nusa Tenggara. The lack of supporting technological facilities in schools is the main challenge for teachers in those three islands to integrate technology into their teaching and learning practices fully. However, teachers in those islands keep going with that challenging technological situation. They have tried various creative ways to deliver teaching and learning materials to their students, such as through radio

broadcasts, the use of HT, and even meeting their students one by one to deliver the learning materials. The various types of support from the Indonesian government and the private sector to improve teaching and learning qualities in those three islands seem to help the schools gradually enhance teaching and learning practices in their areas.

With these concluding points, we would like to suggest the following practical recommendations for teaching and learning practices in a teacher preparation program in a higher education context in Indonesia. First, pre-service teachers (PSTs) should learn the pedagogical knowledge of technology integration. Such knowledge is about different techniques and tools to integrate and how to purposefully, contextually, and effectively integrate such technology. Courses and other learning opportunities should therefore be designed to develop PSTs' knowledge of technology integration as well as digital literacy. Further, as reminded by Kuru-Gönen (2019), PSTs should be encouraged to consider their future classroom setting and listen to students' views of technology integration in the classroom. Secondly and more particularly, teachers' teaching practice or practicum program should necessitate appropriate technology integration to give PSTs hands-on experience in utilizing technology. This should also add to PSTs' authentic experiences, one of the six strategies teacher educators used in teacher preparation programs, as proposed by Tondeur et al. (2012) and Tondeur et al. (2019). Next, Schmid et al. (2021) have pointed out the importance of support in technology integration. While technical or non-technical institutional support is essential, PSTs must never ignore any opportunities to learn and collaborate with other educators to develop their competencies as well as strong technology utilization. Teacher preparation programs should therefore promote supportive collaboration and network-building opportunities. PSTs should be encouraged to join online groups, forums, communities and workshops. Further, teacher preparation programs could follow up, integrate, and foster PSTs' reflections on their collaboration and networking experiences in their in-class learning.

In closing, we would like to propose some recommendations for future researchers who wish to follow up on this study. First, our analysis results were only based on online articles. Future researchers may conduct an in-depth interview with school teachers teaching in Papua, Kalimantan, and Nusa Tenggara to confirm or challenge what we present in this paper regarding the issues and challenges of using technology for teaching and learning purposes. Second, it will be fruitful to explore further how teachers can fully maximize the potential of radio broadcasts and/or HT tools to support teaching and learning in schools with very minimal technology facilities. Third, future researchers may investigate how technology might improve educational equity and overcome the barriers addressed in the areas. Fourth, it will be beneficial if future researchers explore the appropriate gadgets which can be used in the areas and how the devices are utilized to improve students' academic performance.

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