



# Learning Innovations after the COVID-19 Pandemic; Educators Creativity in Conducting Teaching in Indonesia

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## ABSTRACT

This study is intended to describe the learning innovations that teachers make during and after the emergency remote teaching in Indonesia. Distance learning that was suddenly implemented due to the Covid-19 pandemic had a broad impact on all aspects of education. It is qualitative research with steps of collecting data through observation and interviews, whether structured or unstructured, documentation, and visual materials. The data were analyzed using grounded theory. The results showed that there were innovations in methods, development of teaching materials, and teachers-parents communication. Before the pandemic, communication between teachers and parents was mostly done only once a semester, but now teachers communicate with parents more often. Learning methods also vary by integrating various media. Media is no longer just using whiteboards or projectors, but more variations of media are used by teachers. Teaching materials are no longer only from one learning source but are obtained from more varied learning sources.

**Keywords:** Learning, Innovation, After Covid-19 Pandemic, Teaching

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## INTRODUCTION

A pandemic has a wide impact on human life. This impact is not only in the physical field but also in the mental, economic, social, and cultural fields of society (Rattanawan & Pakdee, 2024). The Covid-19 pandemic has also had an impact on the education sector (Tadesse & Muluye, 2020). All levels of education can no longer carry out face-to-face activities directly in the classroom. the implementation of learning must be done using internet network. This has an impact to 45.5 million students from elementary, junior, and senior high school levels throughout Indonesia who cannot conduct real teaching and learning with their teachers. A total of 1,289,786 teachers had to make new efforts that they had not done before the pandemic. This also has an impact on 307,655 schools in Indonesia. With the current pandemic conditions, face-to-face interactions are minimized. Suddenly, the learning process must be carried out remotely by using the existing resources. Utilization of resources and technology is needed to maintain good quality learning.

The age of the teacher also determines his ability to carry out learning by utilizing technology. When viewed from the composition of the number of teachers according to their ages, most of the teachers are 30-39 years old. Some of the teachers with this age range were born in the digital era. Meanwhile, there are 1,192,078 teachers who have an age range of 40-60 years who were born before the digital era. Of course, these teachers must adapt in using technology to carry out teaching learning process.

**Table 1.** Total of Teacher Based on the Age

Age	19	20-29	30-39	40-49	50-59	>60
Total of Teacher	539	396.472	939.031	548.333	547.227	96.518

Sources: (*Indonesia-Education-Statistics-in-Brief-2024-2025-2025-Indonesia*, n.d.)

There are around 1,289,786 teachers who have to change their ways of teaching from face-to-face in the classroom to another format. In these conditions the teacher makes efforts to find methods and media that can overcome the problem. With its limitations, teachers try to innovate through methods and application of existing media and information technology (Tulenbayev et al., [2025](#))

In some cases, there are weaknesses in learning using information technology and online learning. This learning is highly dependent on the existence of a stable internet network(Onojah et al., [2021](#)). Learning is also highly dependent on access to electricity. If students have difficulty, they cannot ask or discuss directly with the teacher, or if they can ask or discuss directly, they still have various limitations.

In addition, the use of gadgets that often have a negative impact and are complained of by parents is also a problem in itself. There are parents who complain that their children use gadgets only for playing games for a long time, while they do not do school assignments and activities. They do not attend synchronous face-to-face learning, but at the same time upload their statuses on social media.

The most important learning done before the pandemic was face-to-face learning. Although face-to-face learning is the main learning activity, studies on online and information technology-based learning have been introduced. The advantage of learning by using information technology is the flexibility of the learner in taking advantage of time outside of classroom activities.

By utilizing information technology, there are several advantages, among others, teachers do not always have to meet directly with students. The teacher can prepare the material in advance for student learning to use. Teachers can be helped by technology to provide explanations and demonstrate something that might not be possible in a real classroom with face-to-face methods. Another advantage is that teachers can use information technology to conduct assessments more quickly.

Several previous studies have been conducted regarding to the use of information technology in learning. Dewantara in his writings conveyed about the creativity of teachers in utilizing IT-based media in terms of student learning styles. The results of the study show that the use of teaching media is not based on consideration of the needs, preferences and learning styles of different students. Teachers have

not been able to accommodate the differentiation of student learning styles, because teachers do not yet have in-depth pedagogic knowledge related to the selection of learning media in terms of students' learning styles (Harpeni Dewantara, [2020](#)). Saputri has conducted research on the development of learning based on android games. The result of her research shows that android games are a form of feasible information technology for use in learning (Saputri et al., [2020](#)).

Some other researches on the impact of COVID-19 had also been conducted in any other countries. In India, the impact of COVID-19 had made a new trend in teaching and learning (Parker, [2020](#)). In UAE teacher, students, administrator, and government are in challenge to the impact of COVID-19 (Ridge & Erfurth, [2020](#)). in Nigeria the funding, infrastructure, school facilities, and teacher welfare become the obstacles of the education in the pandemic era (Okwudiba Anyika & Ijeoma, [2021](#)). The problems of internet access also happen in rural area of South Africa (Dube, [2020](#)).

There are several research gaps that were not addressed in previous studies. These include the absence of any discussion on how communication innovations are carried out, the lack of examination of how different media and methods are integrated in actual learning practice, the failure to explore practical solutions or strategies teachers use to address pedagogical shortcomings when forced into remote learning, and the limited focus on the development of learning materials in remote learning.

With various existing problems and limitations, creativity in the application of methods and media that support the learning process emerges. The application of integrated methods and media is a learning innovation. Then, the question arises of how teachers and parents integrate media and methods in this COVID-19 pandemic. This article will describe learning innovation carried out by teachers and parents/guardians who act as teachers during the COVID-19 pandemic. These questions are broken down into the following four questions: 1) how is the communication innovation used? 2) how is the innovative learning method used? 3) how is the media innovation used? 4) how are learning resources developed?

## **METHOD**

The research employed a qualitative methodology, utilizing multiple data collection techniques to ensure depth and validity. These included efforts to focus the scope of the study, direct observation, both structured and unstructured interviews, as well as the collection of documentation and visual materials. The study was carried out across 143 schools located in Java, Sumatra, and Kalimantan from January 2021 to 2023. Data analysis was conducted using grounded theory, involving systematic coding procedures: open coding to develop categories from the collected data, axial coding to identify relationships and integrate categories within a theoretical framework, and selective coding to construct a coherent narrative based on the interconnections among these categories.

## RESULTS & DISCUSSION

After conducting various observations and interviews, several findings were obtained which can be formulated in several forms of innovations carried out by teachers.

### *Result*

The COVID-19 pandemic has triggered significant changes in education. The data shows that institutions, educators, and learners had to quickly adjust to new ways of teaching and learning due to unexpected disruptions. This time of change has led to a surge of new teaching methods in several areas. Four main areas where notable innovation has happened are communication, teaching methods, learning media, and the exploration of learning resources.

#### *Communication innovation*

Before the pandemic, communication between teachers and parents was rare. Parents usually only take their children to school without interacting directly with the teachers. Especially when students can go to school on their own, parents never communicate with the school or with the teachers. Usually, they come to school only when receiving learning report. And even then, the communication tends to be unidirectional, where the school conveys information about the condition of students at that time. With the COVID-19 pandemic, communication between parents/guardians of students has become very frequent.

The COVID-19 pandemic significantly altered the dynamics of parent–school communication. During school closures and transitions to remote learning, parents and guardians assumed a more active role in supporting students' educational activities at home. This shift necessitated more frequent and structured communication between educators and families to ensure academic continuity, monitor student progress, and provide emotional and logistical support. Interestingly, this elevated level of communication has persisted well beyond the peak of the pandemic. Even in the post-COVID era, schools and parents have maintained increased frequency in their communication strategies.

In most schools, horizontal and vertical communication patterns can work because almost every day employees and teachers are scheduled to come to school. Diametrical communication patterns can also work because some students are monitored directly by the teacher. Most of the monitoring is via WhatsApp group. In one school, WhatsApp Groups are created by class by uniting all subjects into one class group. For example, a class that contains all subjects, each subject teacher is in the group and carries out learning according to a schedule. Teachers can monitor active and inactive students easily. If there are students who are not active and leave classroom, it will be informed to the parents. Communication with parents is easy to conduct because most students also still use their parents cellphones, automatically everything is monitored easily between the school and students' parents. It is

evident that the roles of the parents is very important for the successful teaching learning process and communication (Haiyudi & Art-In, [2021](#)).

Teachers can ask their students to contact them directly via WhatsApp if there is material that is not understood. To ensure that the students follow the lesson, sometimes the teacher makes video calls with students using WhatsApp. During online learning, students who are late or do not submit assignments are usually identified by the teacher of the relevant subject. The subject teacher will contact the homeroom teacher, then the homeroom teacher will find out why the child is not doing the assignment through communication with the student's parents. The homeroom teacher will inform the parents that the child has not collected assignments so that parents can play an active role in building student's enthusiasm and motivation to learn. The evidence shows that the communication was conducted in many forms and media depends on the context, locutor and interlocutor (Fatma et al., [2020](#)). After the pandemic, in several schools, socialization of the school's vision, mission, goals and agenda during the pandemic was carried out to parents, students, and teachers through social media. Briefing activities are carried out by school management every morning 30 minutes before learning begins, and is conducted in the school, in order to obtain the latest information and urgent matters that are felt to be followed up immediately. To maintain communication between teachers and students, besides face-to-face interaction in the classroom, communication is carried out through WhatsApp and Google Classroom media. After the pandemic, this increase in communication has not only continued but has also become more formal in many school systems.

#### *Method Innovation*

In learning during the COVID-19 pandemic, there are various methods used by teachers. In a school that was observed, there were teachers who were unique in carrying out the learning process using WhatsApp groups. The teacher started learning by giving rhymes, and sending links of learning videos with explanations from the teacher himself. By being given rhymes as brainstorming, students do not feel bored with online learning activities.

To internalize the students' religious attitude, in an Islamic-based school, there were also Qur'an recitation activities. Reading the Qur'an is carried out from 07.30 to 08.00 guided by a religion teacher on a scheduled basis which is carried out in the multimedia laboratory, then the recording of the recitation is shared via the school's live streaming YouTube account. In other schools the implementation of joint *tadarus* (recitation) activities is carried out by the teacher. The activity starts from 07-00 WIB - 08.30 WIB for teachers who do WFO (Work from Office) and teachers who do WFH (Work from Home). Students do *tadarus* together in their homes. The religions teacher determined some verses from the school and sent a link to record their *tadarus* to be submitted to him. Although it is not as ideal as if

it is done face-to-face in class, it is still effective during this pandemic. This is in accordance with a study conducted by Hadayani who examined the implementation of religious characters in online learning. In her study, it was stated that increasing religious attitudes could be successful, although not optimal (Hadayani et al., [2021](#)). In a public school, the literacy movement is still being implemented. This literacy movement is usually carried out by students every morning, 30 minutes before learning activities begin. This literacy activity familiarizes students with reading and writing, even though it is carried out from home without direct-face to face supervision from the teachers. There are several criteria for books that should not be used as materials for literacy activities, namely comic books, picture books, and subject books. Before literacy activity begins, the homeroom teacher will inform the children to prepare books that will be used as literacy materials, whether it is story books, novel, or other book as long as they are not comic books, and textbook.

Several methods are also carried out in the use of media. In some cases there are schools that combine online and offline. As stated by a teacher at a public high school in Wonogiri Regency, due to COVID-19, group assignments are no longer held. The media used during this virtual learning are Google Meet, Zoom, Google Classroom, WhatsApp, and Microsoft Team. If needed, the teacher will give assignments offline by means of students going to school to take questions or assignment from the teacher and collect them a week later.

There is another learning method that a teacher used during this pandemic, namely using google classroom to give assignments and also material, while WhatsApp groups are used to give notifications. At an Islamic-based school in Pangkalan Bun, teachers carry out learning activities on a priority scale. The learning media used are also very different from the previous learning media. The teacher uses WhatsApp groups to provide information about the material. Students discuss and learn material through Google Classroom. If the material being taught contains long explanations and may be difficult for students to understand, the teacher will hold a discussion with students via Zoom. In the zoom meeting, the teacher explains the material which then conducts a group discussion and ends with a question-and-answer session.

Based on the results of observations and interviews at a public school in Musi Banyuasin, students can take part in virtual learning. The teacher prepares a Lesson Plan for each material/each chapter. In planning and implementation, the teacher performs apperception, motivates, and provides an overview of the benefits of learning, also conveys learning objectives. The approach used by the teacher is Scientific using Problem Based Learning model. The activities are problem orientation, solution organization, guiding independent and group investigation, describing and presenting work, analyzing and evaluating problem solving processes. The technique used in the form of group discussion, and question and answer. The innovations in teaching methods observed during and after the COVID-19

pandemic also illustrate the remarkable adaptability of educators in maintaining the continuity of learning, despite the challenges posed by remote education.

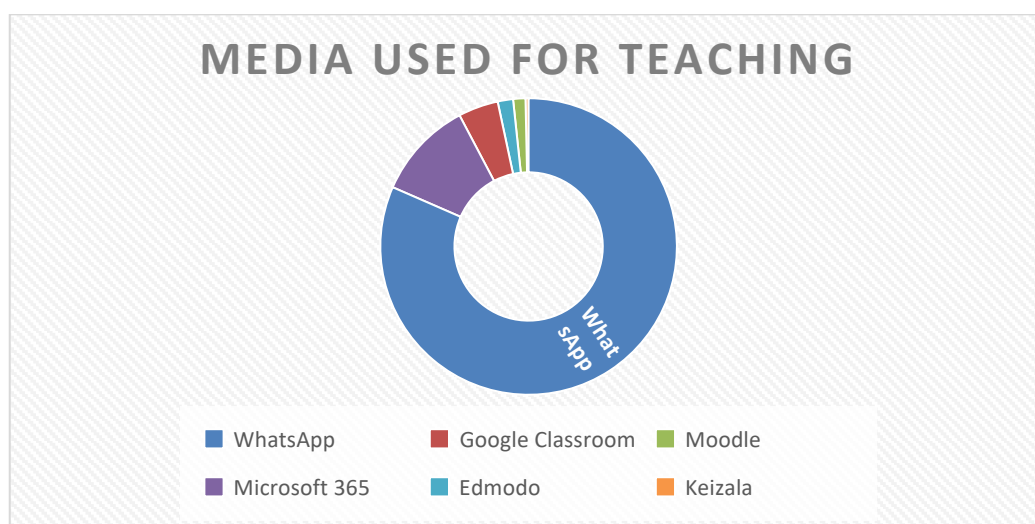
### *Learning Media Innovation*

In learning activities, there are several media used. Media can be hardware or software. There are several hardware used, including desktop computers, mobile phones, tablets, laptops. Some schools provide multimedia laboratories, some provide tablets for teachers and students, several other schools collaborate with local governments to procure android-based mobile phones to facilitate the learning process. In a public school in Purwodadi, the school provides assistance to students by lending tablets, which can be used by students.

In addition to utilizing hardware as a medium in carrying out the learning process, teachers and students also use various applications. In managing learning data, teachers use various types of Learning Management Systems. The most frequently used Learning Management Systems were Google Classroom, followed by Edmodo, and the less commonly used is Moodle. Google Classroom, which is provided by Google, has the advantage of being able to be integrated with various other applications and learning resources. This application can be integrated with Youtube as a learning resource and Google Forms that can be used to make quizzes and to make online attendance. Google also provides a drive that can be used to store learning data and learning materials needed.

In practice, some teachers still have problems using Google Classroom as conveyed by a teacher as follows:

“Our learning uses Google Classroom and WhatsApp. If using Google Classroom is not optimal, I usually give information on material or assignments via the WhatsApp group. So, for collecting assignments, usually the children immediately send a direct message to me by including their name, basic number, and class.”



**Figure 1.** Media Used for Teaching

Edmodo, which is also used by some teachers in schools, has the advantage of being more user-friendly, simple, and providing an assessment application. Teachers who use Edmodo media feel that there is no problem. This is because the media was already used before the pandemic occurred. This is as stated by some informant teachers.

The difficulties faced during online learning are almost non-existent because our school was already IT-based so students were already accustomed to using Edmodo e-learning so they were already used to it for the learning process and for the results they used CBT "Computer Based Test".

Moodle is an open-source application that can be modified flexibly. With the advantages of open source which is of course free, it requires special skills for users to take advantage of this application. In the schools observed, it turned out that there were no problems in using Moodle. Teachers are able to use Moodle to provide material, monitor student activities, assign assignments, and evaluate. In monitored schools, teachers usually use a combination of WhatsApp to communicate and use Moodle for their learning activities.

At a school in Sintang (Kalimantan), in this online learning process the school and each teacher use Google Classroom, Keizala, Microsoft Team, and Google Form (also used for end-of-semester assessments) as supporting applications during the online learning process. For students who are constrained by internet signal/network, they can attend offline schools (outside the network) by taking assignments to school.

In the learning process, the majority of teachers do it online using teleconference. The most used platforms are zoom and google meet. The Google Meet platform is widely used because it can be integrated with Google Classroom. While Zoom is in demand because it has more features that teachers can use in teaching. In post-pandemic period, teachers used internet for some purposes. They used it for managing the assignments, controlling portfolio, and discussion. The internet continue to play a big role



in managing assignments, controlling portfolios, and facilitating discussions in blended learning settings.

### *Learning Resource Exploration Innovation*

Most of the learning resources used by teachers during learning are textbooks, articles from the internet, or other sources that support the implementation of learning. The teacher develops material during learning by explaining the material, then giving students the opportunity to ask questions that have not been understood.

Some teachers use companion printed books, this is due to the teacher's consideration that there is no face to face in class like a normal situation. When the teacher makes a learning video or learning PPT, at the end of the lesson there is an assignment from the companion printed book. This makes it easier for students because there are instructions and all students have the accompanying book so that students can immediately physically open the book.

At the observed school in Sintang city, the teacher identifies each student. Students who do not borrow books from the library are required to borrow related textbooks. In addition, the teacher will also provide material that has been made concisely but with a complete explanation regarding to the material. By such innovations, it is hoped that students will more easily understand the learning material. This is also done to support student learning so that what is given by the teacher can provide learning opportunities and improve student knowledge.

### *Discussion*

The COVID-19 pandemic was a turning point in how schools communicate with parents and guardians. During remote learning, the need for active parental involvement in students' daily education became clear (Le Nghi Tran et al., [2025](#); Vogel et al., [2023](#)). To overcome physical distance and tackle teaching challenges, schools used various digital communication tools to stay in touch with families. Digital communication tools provide several benefits to the schools when contacting the families. It enhances information sharing such as timely and responsive communication, convenience, and accessibility (Beeli-Zimmermann et al., [2024](#)). This time underscored the importance of strong partnerships between educators and caregivers (Wu et al., [2023](#)). These connections were vital for tracking academic progress and addressing students' social and emotional needs, as well as concerns about digital access (Rodriguez & Liu, [2023](#)).

After the pandemic, this increase in communication has not only continued but has also become more formal in many school systems. Educators and school leaders now understand that regular and open communication with families helps boost student engagement, motivation, and overall academic

success (Marah et al., [2025](#)). Instead of going back to pre-pandemic practices—where parental involvement was limited to specific events or emergencies—many schools have established more frequent, proactive, and two-way communication methods. This change has also highlighted the importance of digital skills and access for educators and families, pointing to the need for fair communication resources (Montenegro et al., [2023](#); Torrato et al., [2023](#)).

Another important aspect of this change is how parental involvement is seen differently now. It has shifted from a supportive role to that of a co-participant in the learning process. By promoting regular communication, schools have opened doors for parents to play a meaningful role in their children's education, leading to a more inclusive and community-focused approach to learning (Rodriguez-Oramas et al., [2022](#)).

The innovations in teaching methods observed during and after the COVID-19 pandemic also illustrate the remarkable adaptability of educators in maintaining the continuity of learning, despite the challenges posed by remote education. Through the creative use of digital tools, blended learning strategies, and innovative teaching practices, educators were able to engage students in meaningful ways, whether through WhatsApp groups, online recitations, literacy routines, or problem-based learning activities. These findings suggest that the lessons learned during the pandemic have the potential to inform future educational practices, contributing to a more flexible, interactive, and student-centered approach to teaching and learning.

Despite the difficulties associated with remote learning, the COVID-19 pandemic's innovations in teaching techniques also demonstrate the extraordinary flexibility of educators in preserving the continuity of learning. Whether through online recitations, literacy routines, WhatsApp groups, or problem-based learning exercises, teachers were able to meaningfully engage students through the innovative teaching practices, blended learning strategies, and creative use of digital tools. These results imply that the knowledge gained during the pandemic may influence future teaching methods, resulting in a more adaptable, participatory, and student-focused method of instruction.

In the post-pandemic period, many learning media changes that started during the COVID-19 crisis are likely to stick around. The internet continue to play a big role in managing assignments, controlling portfolios, and facilitating discussions in blended learning settings. As schools move toward a more digital approach, the internet and cloud-based platforms will still support learning, even as they go back to in-person classes. The pandemic sped up the shift to digital education, and teachers are now better prepared to use technology in their teaching. This change in learning media will keep influencing the future of education. It may lead to more personalized, flexible, and inclusive learning experiences.

## CONCLUSION

The Covid-19 pandemic has had a broad impact on the implementation of learning in Indonesia. Learning that is usually done in the classroom must be carried out in a different way, namely by remote teaching. With this remote teaching learning, there are several new things that teachers do, which they did not do in the past. This action is an innovation that they use to solve problems in carrying out tasks. There are several classifications of innovation, namely communication innovation, method innovation, media innovation, and innovation in the development of teaching materials.

Before the pandemic, communication between teachers and parents was mostly done only once a semester, but now teachers communicate with parents more often. Learning methods also vary by integrating various media. Media is no longer just using whiteboards or projectors, but more variations of media are used by teachers. Teaching materials are no longer only from one learning source but are obtained from more varied learning sources.

This study describes learning innovations that emerged during and after the Covid-19 pandemic, but it has several limitations. The findings are based on a limited context and may not represent all school conditions in Indonesia, especially those with different technological access. The study also focuses on describing practices rather than evaluating their effectiveness on student learning outcomes.

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