

The Transformation of Distance Learning: Technological Challenges and Opportunities in Digital Era

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Abstract. This study aims to analyse the transformation of distance learning during and after the pandemic Covid-19. The study used qualitative approach using a case study design. The participants in this study are 10 communication studies students currently in their second year. Data collection for this study was carried out through interviews and a literature review. In-depth interviews were conducted in three stages. Data analysis was carried out through the stages of data collection, data selection, data analysis, and the formulation of conclusions. The results of this study indicate that distance learning has transformed learners, enabling them to adapt to technology. The use of technology is not limited to entertainment but also supports the learning process. However, not all learners feel comfortable with distance learning. This is because every student has a different learning style. This study concludes that the transformation of distance learning must be aligned with students' learning styles. Furthermore, distance learning must be able to build students' self-confidence and collaborative skills. Consequently, they can identify opportunities to adapt to learning in the digital age.

Keywords: Distance Learning, Pandemic Covid-19, Learning Outcomes, Digital Era, Learning Communication.

1 Introduction

During the Covid-19 pandemic, various academics conducted research into distance learning[1][2]. Distance learning was implemented by the government as a measure to minimise the spread of Covid-19[3]. Unfortunately, some academics have noted that distance learning during the Covid-19 pandemic has given rise to a variety of problems[4][5]. One of the issues that has emerged is the lack of social interaction between teachers and students. Furthermore, students in primary and secondary schools were not yet prepared for distance learning due to their economic circumstances[6]. There were still students who were unable to participate in distance learning because they lacked smartphones and internet connections. Consequently, some students continued to face difficulties at the outset of distance learning during the Covid-19 pandemic[7].

Abidin et al. [8] found that students were struggling with distance learning due to a lack of prior training and support. Consequently, they had to learn independently and were encouraged to adapt within a short timeframe. Basar [9] emphasises that distance

learning can be optimised if efforts to improve the quality of education are sustained. Furthermore, the sustainability of distance learning also needs to be optimised. During the Covid-19 pandemic, all sections of society worldwide were forced to respond to urgent changes. Education has been one of the sectors most severely affected by the Covid-19 pandemic. Sucipto [10] It is noted that the Covid-19 pandemic has resulted in learning delays and learning gaps. This is because parents, students and teachers were not prepared for distance learning.

Unlike higher education, distance learning is not a new model of learning. The Indonesia Open University is one of the higher education institutions that has implemented a distance learning system[11]. Therefore, the use of technology is essential to support distance learning. Unfortunately, Masrurroh [12] found that inconsistent internet connectivity remains a challenge for Open University students undertaking distance learning. This situation is a point of concern for both primary and secondary schools as well as higher education institutions. Conceptually, Keegan [13] provides guidance that the nature of distance learning requires a separate approach for both teachers and learners. Furthermore, two-way communication channels must be provided so that learners can initiate dialogue and benefit from it.

Since the beginning of 2020, coinciding with the issuance of Circular Letter No. 1 of 2020 from the Ministry of Education and Culture, Directorate General of Higher Education, regarding the Prevention of the Spread of Covid-19 in Educational Settings, the education sector has undergone a revolutionary transformation. Apart from internet connectivity and smartphones, another challenge is the demand on teachers to deliver an engaging learning experience for learners. However, in reality, this remains difficult to achieve due to a lack of training and support. Nevertheless, advancements in communication and digital technologies continue to progress. Distance learning provides an opportunity for learners to gain a better understanding of technology[14][15]. Furthermore, the use of virtual learning in the distance learning process is believed to offer greater ease of learning, as well as enabling direct communication so that the material is easily understood. However, conducting online learning requires adequate facilities and infrastructure, such as an internet connection, smartphones, laptops, and computers. A key influencing factor is parental understanding, support, and assistance[16].

Conceptually, distance learning requires good communication between students, parents and schools. Previous research, however, suggests otherwise. In primary and secondary education, distance learning presents a new challenge for parents. This is supported by studies indicating that the impact of distance learning during the pandemic has led to poorer family communication between children and parents. This situation arises because parents lacked prior experience with distance learning[17][18]. This phenomenon raises significant questions regarding the future experiences of primary and secondary school students who have now lived through the pandemic. To date, no research has analysed in depth the experiences of students during the pandemic and the subsequent end of the pandemic. Therefore, this study aims to analyse the transformation of distance learning during and after the Covid-19 pandemic. Consequently, this study focuses on the future transformation of distance learning in higher education based on learning experiences during and after the Covid-19 pandemic.

2 Literature Review

2.1 Distance Learning in Pandemic Covid-19 Era

The learning process, whether we realise it or not, always involves teaching and learning activities aimed at achieving educational outcomes for students[19]. In other words, online distance learning is a form of open learning facilitated by educational tools such as the internet and technology. During the Covid-19 pandemic, distance learning has become an alternative way for students to continue their education. Peters [20] It is considered that distance learning is a model of education that encourages students' independent learning. Consequently, distance learning is regarded as an industrialised form of education. This is because distance learning can cater for large numbers of students simultaneously. In contrast to Holmberg [21] which indicates that distance learning is non-continuous. In other words, sessions are only held occasionally and are best suited to adults who have jobs, families and other social commitments. However, Holmberg and Peters share the view that distance learning can foster learners' independence.

Study of Adi et al. [22] shows that distance learning during the COVID-19 pandemic has had negative impacts, such as inadequate internet connectivity, students struggling to understand the material, a lack of motivation to learn, and limited facilities. However, the positive impact is that distance learning is more practical and relaxed. Furthermore, students are more engaged in completing assignments. Previous studies have also examined distance learning during the pandemic, focusing on the obstacles, challenges, impacts and expectations throughout the learning process [23][24].

2.2 Digital Divide in Distance Learning

The digital divide is a complex and dynamic phenomenon. This is because the digital divide is influenced by various factors, such as socio-economic, demographic and technological characteristics. Generally, the digital divide is based on the 'resources and appropriation' theory developed by Dijk [25]. The digital divide leads to an unequal distribution of resources caused by inequalities in factors such as age, education, income, geographical location and social status [26]. Access to digital technology encompasses four stages: motivation and a positive attitude, physical access, digital skills, and meaningful use that yields benefits. In other words, the digital divide is not merely a technical problem, but also a structural issue that reinforces existing social inequalities[27]. To this end, there are different levels of the digital divide: the first level relates to the physical access gap—that is, access to devices and the internet. The second level concerns the digital skills and usage gap, such as the ability to operate learning platforms. The third level pertains to the outcomes and benefits gap, such as academic achievement, engagement and graduation rates[28]. Throughout the Covid-19 pandemic, a gap has emerged whereby students in rural areas and those from low-income backgrounds have faced a digital divide in distance learning.

3 Method

Qualitative approaches are commonly used as a strategy for developing social constructivist theory. In analysing students' experiences of distance learning during and after the pandemic, a qualitative approach can be used to obtain more in-depth and comprehensive information. Therefore, the method employed in this study is a case study. The case studies in this research aim to explore participants' experiences of distance learning during the pandemic and their experiences of learning after the pandemic was declared over.

Miles and Huberman [29] indicates that several criteria are used in determining the research subjects, such as setting, actors, events and processes. This study was conducted at the State University of Jakarta. The target actors were second-year students on the Communication Studies programme. The events referred to in this study were the distance learning process. Regarding the process criterion, in-depth interviews were conducted with participants concerning their opinions and views on distance learning. To this end, the participants in this study comprised 10 students, of whom eight were female and two were male. Generally, the participants had backgrounds in public lower and upper secondary education. Consequently, during the Covid-19 pandemic, they undertook distance learning from 2020 to 2022. Subsequently, learning was conducted using a hybrid model on a phased basis.

Data collection in this study was carried out through in-depth semi-structured interviews. Consequently, during the interview process, the researcher used an interview guide comprising five initial questions, which subsequently evolved. These five initial questions related to the respondents' lower secondary and upper secondary educational backgrounds, their experiences of distance learning during the pandemic, the challenges faced during the learning process, and their learning experiences following the COVID-19 pandemic. The questions evolved in line with the research requirements. Subsequently, the researcher conducted a literature review by searching for previous studies relevant to this research in national and international journals. The data analysis technique used in this study was based on the model by Miles and Huberman [29]. The researcher carried out the process of selecting and simplifying the data obtained. This process is known as data reduction. After carrying out data reduction, the researcher presented the data, from which conclusions were subsequently drawn.

4 Results and Discussions

4.1 Results

The findings of this study provide a broad overview of students' experiences of distance learning. Initially, the distance learning system felt unfamiliar to all participants. This was because they were accustomed to face-to-face learning in the classroom. During the Covid-19 pandemic, students began to be introduced to digital technology for their learning activities. Generally, the distance learning activities undertaken by the

participants were integrated with digital technologies such as Google Meet and Zoom[30]. After attending online sessions, students were assigned tasks via Google Classroom. Eight out of ten participants reported similar experiences during distance learning throughout the Covid-19 pandemic.

“At first I was happy because learning during the Covid-19 pandemic was conducted online. However, as time went on, I felt I was falling behind in understanding the learning material. Furthermore, I became unfocused and easily bored.” (Kalula, 20 years old, January 2026).

“My experience with distance learning at lower and upper secondary school was positive at the start. This was because the distance from my home to school was quite far, and it saved on transport costs. However, over time, I began to feel unmotivated due to the unsupportive learning environment and difficulty in understanding the material being taught, compounded by occasional issues with an unstable internet signal.” (Audrina, 20 years old, January 2026).

Based on the interviews conducted, students shared similar experiences with distance learning. Learning during the Covid-19 pandemic underwent such rapid changes[31]. It began with a sense of joy at not having to go to school, but gradually students found it difficult to study independently. This was because they struggled to understand the material and there were no guidelines for conducting distance learning. Furthermore, every participant encountered network issues whilst undertaking distance learning. Consequently, a transformation of distance learning is required.

On the other hand, distance learning during the Covid-19 pandemic provided students with valuable learning experiences[32]. When students continued their education at university, they did not face difficulties in using technology during the learning process. This presents an opportunity for students to enhance their skills in integrating technology into the learning process.

“Based on my own learning experience, both distance learning and traditional learning have their own strengths and weaknesses. However, blended learning could be the solution to make the learning process more adaptable.” (Syaura, 20 years old, January 2026).

“After the pandemic ended and learning returned to face-to-face sessions, I noticed a significant difference. Face-to-face learning feels more effective because I can ask questions immediately if I don’t understand something, discuss with friends, and focus better whilst studying. Social interaction has also returned, making the learning atmosphere more lively and less boring.” (Raihanun, 20 years old, January 2026).

Distance learning does not always have a positive impact. However, this study suggests that students have varied learning experiences. Consequently, not all students are suited to distance learning methods. Therefore, the findings of this study suggest that the

transition to distance learning should be implemented through blended learning. Blended learning combines face-to-face classroom learning with online learning[33]. With blended learning, students will continue to experience adaptive learning and be able to engage in discussions. Blended learning is also adopted by some universities as a way to capitalise on technological advancements in the digital age[34].

On the other hand, distance learning can also be enjoyable if ice-breakers or quizzes are incorporated. Furthermore, participants suggested that distance learning should include elements of games. This ensures students do not get bored easily and find it easier to understand the material. Quiz applications such as Kahoot or Quizziz can be used[35]. To encourage cooperation among students, group games such as guessing the subject matter or role-play can also be conducted. Online learning can be enjoyable if teachers use more interactive methods such as discussions, quizzes and educational videos, rather than simply setting assignments. A less packed timetable and good communication between teachers and students may also make online learning more comfortable. Good internet connectivity and engaging learning materials can also help ensure students do not get bored easily whilst studying from home.

The challenges of distance learning also relate to building trust. During distance learning, communication can still be considered ineffective as it is limited by time and internet connectivity. Therefore, question-and-answer sessions are crucial, as they allow students to demonstrate interaction and engagement whilst the lesson is taking place. Furthermore, distance learning can still foster a spirit of cooperation among students, although not as strongly as in face-to-face settings. This can occur when teachers assign group tasks or collaborative projects that require students to discuss via platforms such as WhatsApp groups, Google Classroom, or video meetings[36]. Through these, students can still share ideas, help one another, and learn to work as a team.

4.2 Discussions

Technological progress is generally regarded as a phenomenon that can bring convenience to its users. Furthermore, it can drive innovation across various fields, one of which is education. The presence of technology can also serve as a solution to problems such as the Covid-19 pandemic. However, this study highlights that the use of technology also requires testing, particularly within the learning process. This is because technology-integrated distance learning still faces various challenges, such as the limited availability of electronic devices and internet connectivity. Consequently, the findings of this study contradict the concept of Keegan [13] which stipulates that two-way communication channels must be provided so that learners can initiate dialogue and benefit from it. Consequently, during distance learning, obstacles were encountered relating to students' skills in using the applications.

On the other hand, some of the challenges faced by students during distance learning include frustration in their attempts to master the technology[35]. This is because each student has a different level of understanding regarding the skills required to operate the application system used in learning. Consequently, when lessons take place, students are no longer focused on the subject matter but rather on the devices they are using. Thus, the findings of this study are consistent with Adi et al. [22] namely,

distance learning during the COVID-19 pandemic has had negative impacts such as inadequate internet connectivity, students struggling to understand the material, a lack of motivation to learn, and limited facilities. Indeed, students have even experienced a decline in their enthusiasm for learning because their learning styles are not aligned with the teaching methods employed.

This study indirectly suggests that distance learning can be implemented using blended learning methods. This serves as a transformative approach to minimise the obstacles faced by students. Generally, the platforms used for distance learning are limited to Zoom and Google Meet[37]. Additionally, Google Classroom is typically used for assignments. Meanwhile, since the onset of the COVID-19 pandemic up to the present, various academics have developed learning methods that can be integrated with distance learning. The findings of this study also confirm that technological issues contribute to the difficulties students face in learning, due to the increased workload and limited teaching time. Consequently, students lack confidence in their learning outcomes.

On the other hand, the accessibility of learning materials is one of the factors influencing student satisfaction with distance learning. However, the findings indicate that the majority of students find it difficult to understand the learning materials provided online. Consequently, students lack confidence in their learning outcomes. Students acknowledge that the materials provided are not yet optimal and that interaction with teachers is largely focused on delivering content and assigning tasks. Students also feel that, due to online interaction, completing assignments is relatively easy and can be assisted by others. This poses a challenge as it may lead to plagiarism in assignments or render the tasks unable to assess the individual student's own abilities.

Furthermore, students' experience of distance learning during the pandemic has taught them valuable lessons in building teamwork. With distance learning, students are typically set individual and group tasks[38]. It is during these group tasks that they are able to share information regarding the learning material. This study provides an overview of the process by which students engage in collaboration during distance learning. Consequently, once distance learning was discontinued, students had already become accustomed to learning in groups.

However, this study highlights the importance of self-directed learning skills among students[16]. During and after the distance learning process, students' enthusiasm for learning did not change significantly. This is because technological advancements, particularly the introduction of Artificial Intelligence (AI), have made it easier for students to access information but have not enabled them to analyse and use that information wisely[39]. Consequently, students remain prone to instances of plagiarism. Therefore, self-directed learning is crucial as an opportunity for the transformation of distance learning. Learning autonomy guides students to develop an awareness of independent learning and not to rely on others. Furthermore, students are required to demonstrate initiative and take the lead in their learning and behaviour. In other words, students possess the discipline and skills to manage their learning independently to achieve their goals. In any situation, students will be prepared to learn and minimise learning loss[40].

The findings of this study lead us to understand that during the Covid-19 pandemic, distance learning was a solution that ultimately needs to be evaluated. This is because, once the pandemic ends, traditional learning remains an alternative for fostering students' enthusiasm for learning and collaboration. This is because students have not yet developed good independent learning skills. Consequently, when the Covid-19 pandemic ends, students will still rely on teachers for constant guidance. This could impact the learning process in higher education. For this reason, blended learning is required as a transformation of distance learning[41]. However, blended learning also needs to integrate students' learning independence so that they are able to engage with various resources and activities such as independent reading, group study, and exercises and correspondence activities[42]. This is because learning independence does not mean isolating oneself from others, but rather being able to transfer one's learning outcomes—in the form of knowledge and skills—in various situations.

5 Conclusion

This study concludes that the transition to distance learning can be achieved by implementing blended learning methods. Furthermore, when organising distance learning, training and support are required for users to prevent them from experiencing culture shock. In addition, distance learning provides opportunities for students to develop their independent learning skills. Consequently, after engaging in distance learning, students should possess characteristics of independent learning, such as planning and selecting their own learning activities. Furthermore, students can also take responsibility for their learning. In other words, once distance learning has concluded and they return to traditional and conventional learning, they should continue to implement independent learning. This study has limitations regarding research methods and research subjects. Future research could employ mixed-methods research and use teachers as research subjects to accurately expand the body of knowledge regarding distance learning. Ultimately, this study hopes for collaboration between the government and academics to foster students' independent learning from primary school through to higher education. This is to ensure that students are prepared to face various challenges that may require them to return to independent learning at home.

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