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The Future of Online Learning in the Post-COVID-19 Era

Jamilah Jamilah and Eni Fariyatul Fahyuni*

Management of Islamic Education, University of Muhammadiyah Sidoarjo, Indonesia

ORCID
Eni Fariyatul Fahyuni: https://orcid.org/0000-00003-0701-7027

Abstract.
The COVID-19 pandemic has resulted in a rapid move to online learning in schools across Indonesia. However, responses to online learning vary widely. With the hasty move to remote study, most parents worry about missing out on learning, while others have experienced benefits. With the fall in the affected cases, many students and parents expected schools to return to face-to-face learning. However, digital literacy must be maintained considering its importance in preparing students for future challenges. This study discusses whether online learning methods can be supported post-COVID-19? A systematic literature review was carried out to address this issue by documenting and reviewing all articles related to post-pandemic learning design for the period 2019–2021. The articles used in this study are 21 nationally and internationally accredited journal articles accessed from lens.org, Google Scholar, Research Gate, and DOAJ. Results proved that online learning can be modified and combined with offline learning into a blended learning method, which can be adopted and utilized by schools post-COVID-19.

Keywords: face-to-face learning, online learning, post-COVID, blended learning

Corresponding Author: Eni Fariyatul Fahyuni; email: eni.fariyatul@umsida.ac.id

1. Introduction

COVID pandemic 2019 has been something that has been very surprising and has captured attention since the beginning of 2020. At the end of 2019, when many cases attacked in Wuhan-China, no one expected this case to reach Indonesia and cause fundamental changes. in Indonesia and around the world. On January 30, 2020, WHO declared COVID-19 a Public Health Emergency of International Concern (PHEIC). On February 12, 2020, WHO officially designated this novel coronavirus disease in humans as Coronavirus Disease (COVID-19) [1].

As a form of COVID-19 prevention, around 68 million students in Indonesia have been forced to leave the classrooms where they usually study since the launch of learning from home in mid-March 2020 in several regions in Indonesia [2]. This disruption is even more drastic than the disruption caused by the industrial revolution 4.0. There

have been mixed impacts on educational institutions regarding these changes, although almost all of them were negatively impacted. Educational institutions must desperately be able to implement distance learning. This significant effort occurred in schools that had never implemented distance education or did not have the resources in the form of a Learning Management System (LMS). The burden is slightly lighter for schools that are accustomed to e-learning in learning and evaluation because they do not start from scratch.

Community responses at the beginning of the implementation of online learning are very diverse. Some students feel comfortable with online learning, especially in schools and school residents (students and teachers) who already have adequate online learning support facilities. Digital literacy skills and adequate mastery of information technology from teachers also support student success and satisfaction in online learning during the pandemic. However, there are still many schools and teachers who do not have adequate resources to carry out online learning. Parents also complain about online learning because it adds to the burden on parents. Apart from paying tuition fees, parents must also devote time and energy to supervising education at home. Another negative impact of online learning is the existence of isolation in the sense that students cannot socialize well, learning motivation decreases, and it is not easy to get feedback from teachers [3].

The terms online learning, distance learning, web-based learning, virtual schools, e-learning, and distance education are often used together and interchangeably [3]. In this paper, online learning is when teachers and students are separated by time and place. Online education is a general concept for online teaching and learning with the help of technology tools and platforms. Online learning can be done synchronously or asynchronously. When implemented asynchronously, students can independently access learning materials that have been prepared by the teacher. Meanwhile, during Synchronous, students access learning media at a predetermined time, followed by feedback or communication related to the material discussed via chat or video conference [4]. A learning management system that contains materials, exercises, and assignments can support online learning. The LMS may also contain other information related to learning. However, not all types of learning can be done with online learning or using LMS. From the weaknesses of e-learning and online learning, an innovation from face-to-face learning and web learning emerged which became known as blended learning [5]. In blended learning, students have independence in accessing learning resources at LMS but personal responses and relationships can still be done[6]

Over time, students, parents, and schools have started to get used to doing distance learning during the COVID-19 pandemic. Facilities and infrastructure to support online learning have begun to be fulfilled evenly to support the implementation of online learning even better. Another positive impact obtained from online learning is the increase in mastery of digital literacy even though students and teachers previously studied it out of necessity. Many students feel comfortable studying remotely because they don't have to leave the house. Students can also learn independently and are not limited by space and time [3]. The results of research conducted by Perez-Villalobos et al. shows that given what type of learning they will choose after the pandemic ends, Indonesian students prefer to take online learning rather than face-to-face [7].

After the COVID pandemic began to subside, schools that were closed were reopened, and limited face-to-face learning resumed. Many parents welcome the reopening of schools for various reasons, one of which is that there are some habits and skills that are difficult to teach during distance learning. With the reopening of this school, will the distance learning that has been developed so far and the sound effects that accompany it will disappear again like before the pandemic hit the world?

From the introduction, we pose the Research Question of this paper: What is the future of online learning methods in the post-COVID era?

2. Method

This scientific article was prepared using the Systematic Literature Review (SLR) method. Systematic literature review is a method that identifies reviews, evaluates, and interprets all available research. In this kind of method, the researcher reviews and identifies journals in a structured manner following the steps that have been set in each process. A systematic literature review was carried out following the approach proposed by [8]. There are five steps to conducting a systematic review: formulating research questions, identifying relevant articles, assessing article quality, summarizing evidence, and interpreting findings. The purpose of a systematic literature review is to provide answers to the research questions described in the introduction. To complement this study, researchers collected journal articles from Lens.org, Google Scholar, Research Gate, and DOAJ. The keywords are keywords that are specific to online learning in the post-Covid era. For material and collected in this study are journal articles with a timeline between 2019-2021 to capture the recently published literature — the methodology adopted in the systematic review.

There are five phases involved in collecting and analyzing articles. The first phase is identification. In this phase, the keywords used to collect articles from all databases are "Online+learning", "face-to-face learning", "Blended

learning" and "post COVID". There were 320 results found. The second stage is filtering. The 320 articles from the early stages were screened by time range, publication type, and journal type. This second stage excluded 194 papers and only 128 papers were processed. The third stage is feasibility where the abstract of the article/journal is being analyzed. From 128 papers reduced to 36 papers. The fourth stage is inclusion where the rest of the papers are recorded in a systematic format, read and omitted for irrelevant results..

Only 21 papers are left in this phase. The last stage is to create a profile table. This stage is done by examining the keywords used. The results are tabulated in table 1 and processed for further analysis and interpretation of the findings.

3. Findings and Discussion

Online learning was used in universities long before the pandemic [9]. Unfortunately, online learning in schools is still rarely used, especially in primary and secondary schools. The traditional face-to-face learning method is considered more effective because it does not require computers, internet, and other supporting devices.

Face-to-face learning also does not require mastery of information technology by both students and teachers. However, with the pandemic and the closure of schools for face-to-face learning, online learning is starting to be implemented worldwide [10]. According to Stanford University, online learning is delivered entirely online, and there is no physical contact between students and teachers.

Online learning can be done through the internet and other digital platforms. Correspondence by email, internet-based, mobile learning such as cell phones, radio, television, and CD ROM are digital platforms. Digital learning management systems are also used in online learning, such as Google Classrooms, ClassDojo, CenturyTech, Edmodo, Edraak, EkStep, Moodle, Nafham, Paper Plane, and Schoology. Online live-video platforms are also used in online learning, such as Hangouts Meet, Teams, DingTalk, Lark, Cisco Webex, Skype, and Zoom [11].

Online learning can make education significantly accessible, cheaper, and flexible [3]. Online learning can develop well in this digital era, especially during the Pandemic.

21 articles that have been further processed related to the future of online learning post-pandemic are listed in Table 1

From the table above, we can see that 80% of teaching and learning processes in newspapers still recognize the effectiveness of traditional face-to-face learning [1,3,7,10,11,12,14,15,16,17,18,19,20,21,22,23,24]. Nevertheless, during the pandemic 100% online learning is used in all reviewed articles. The methods used in online learning in the articles reviewed are very diverse. There are those who use *virtual meetings* [7], *virtual classrooms* [15,23], e-learning [11,12], hybrid courses [19], mixed methods [9,14, 16] and blended learning [1 ,9,11,14,16,17,18,19,21,].

Online learning, which is the main alternative during a pandemic, needs to be developed to respond to the times that are supported by technology in various aspects of life. Online learning has proven to be successful in replacing traditional learning during a pandemic with preparation, refinement, and support from various parties. Another study shows that the success of online learning is supported by students' motivation and personal discipline [3] and provides opportunities for students to express expectations regarding online learning [13], [14]. From the teacher's perspective, the success of online learning comes from the preparation of teachers [17] and the improvement of skills to conduct online learning [18]. Another proponent of successful online learning is direct feedback about learning achievement and progress, and the necessary non-verbal communication between students and teachers [16].

During the pandemic, many studies can be developed to support online learning in the next stage. From the evaluation of online learning in the pandemic era. The implementation of online learning in the post-COVID era is supported in 76% of the articles reviewed. There are improvements that must be made, namely:

1. Availability of supporting facilities such as hardware and software, internet network and development of learning management system (LMS) [21], virtual class [23], and other supporting applications to create a pleasant online learning environment [2]. 24].

2. The engineering curriculum and learning syllabus include curriculum objectives, curriculum content, and instructional approaches that lead to online modalities [20].

3. Prepare the skills of students and teachers in mastering technology to support learning [7].

4. There is sufficient support from the government or stakeholders to continue online learning as part of 21st century skills .

Of the articles that support online learning to support the implementation of online learning in the post-COVID era, there are 60% of articles stating that blended learning

TABLE 1: References for the Future of Online Learning in the Post-COVID Era

Future Features of Online Learning in the Post-COVID Era Face	-to-face	learning online learning	Post-COVID	mixed learning
Pandemic Impact Corona Virus in Education [1]	.	.	.	.
Systematic Literature Review on the Effectiveness of Distance Learning: Problems, Opportunities, Challenges, and Predictions [3]	.	.		
Continued use of virtual meeting platforms for the classroom in the post-coronavirus era: Mediating effects of technology readiness and social presence [6]	.	.	.	
Systematic Review of the Spread of COVID and Online Education Pedagogy [8]	.	.	.	
The impact of the covid-19 pandemic on students' e-learning experience in Jordan [10]	.	.	.	
Factors and Recommendations to Support Student Enjoyment of Enjoyable Online Learning: A Mixed Method Study During COVID-19 [9]		.	.	.
The Future of Mobile Learning During and After the Global Pandemic (Covid-19): Colleges of Primary Education as a Case [12]		.	.	.
Peer-observation initiatives to increase student engagement in synchronous virtual classrooms: A case study on shifting COVID-19 mandates to online learning [13]	.	.		
Online Education in the Post-COVID-19 Era: Students' Perceptions and Learning Experiences [14]	.	.	.	.
From Physical Classrooms to E-Learning and Online Teaching: A Case Study of Light International School, Mombasa [9]	.	.	.	.
Teaching Science in The New Normal: Understanding the Experience of Middle School Science Teachers [15]	.	.	.	.
Are We Ready for Post-Covid-19 Educational Practices? Investigation of What Educators Think About Online Learning [16]	.	.	.	.
Post-COVID-19 Adaptation; The Shift Towards Online Learning, Hybrid Course Delivery and Its Implications for Bioscience Courses in Higher Education Environments [17]	.	.	.	.
Rethinking Education in the Post-Covid-19 New Normal Era: Curriculum Study Perspective [18]	.	.	.	.
The Face of Education and Teachers Without a Face Post COVID-19 [19]		.	.	.
Online submissions and assessments during COVID-19: Maintaining academic integrity [20]		.	.	
Virtual Classroom: The Future of Education Post COVID-19 [21]	.	.	.	
Designing an Effective Learning Environment for Language Learning During the Covid-19 Pandemic [22]	.	.		
The Covid-19 Outbreak and New Normal Teaching in Universities: Empirical Solutions from Islamic Universities in Indonesia [23]	.	.	.	
The COVID-19 crisis and the continued use of virtual classrooms [24]	.	.		.
The emergence of the online-merge-offline learning (OMO) wave in the post-COVID-19 era: A pilot study	.	.	.	.

is the best alternative. Although online learning has many advantages, there are certain times when a student's physical presence is required [16], [11],. Research conducted by Huang et al. demonstrated that *Online-merge-offline* (OMO) can expand learning spaces, ensure health and safety during a pandemic, and provide flexible and open learning methods and interactions.

Blended learning can be an alternative to post-Covid learning because it maintains online learning that was developed during the pandemic and involves physical presence and social interaction, which are the main characteristics of face-to-face learning [1], [11],[12], [17], [18], [19]–[21],. With blended learning, the digital skills and infrastructure that have been built during the pandemic can still be honed and utilized in the post-COVID era.

4. Conclusion

Online learning that developed during the covid pandemic needs to continue to be developed in the latest learning because digital skills are 21st century abilities that students must master. Online learning can continue to be carried out in the post-COVID era, which is supported by 76% of reviewed articles.

In the post-COVID era, online learning can be modified and combined with offline learning into a blended learning method. This method can overcome the shortcomings of online learning and face-to-face learning. Blended learning also provides learning flexibility and is supported by 60% of the articles reviewed.

Acknowledgments

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