



## **Profiles of Learning Models and Media While Online Study During the Covid-19 Pandemic: A Literature Review**

**Iqbal Ainur Rizki<sup>1(\*)</sup>, Hanandita Veda Saphira<sup>2</sup>, Nina Fajriyah Citra<sup>3</sup>**

<sup>1,2,3</sup>Universitas Negeri Surabaya, Jl. Ketintang 60231 Surabaya, Indonesia

---

### **Abstract**

Received : 19 Apr 2022  
Revised : 15 Sept 2022  
Accepted : 20 Nov 2022

The Covid-19 pandemic has had a major impact on education in Indonesia. Therefore, teachers need to build a learning system using media and learning models following current pandemic conditions. In this regard, the study is focused on analyzing effective learning models and media to provide their advantages and disadvantages when used during online learning so that teachers can choose a learning system that suits students' needs and conditions. This research uses literature study methods with qualitative descriptive analysis. There are 12 journals that have been successfully obtained and reviewed from the title, research results, and conclusions. The findings showed that suitable online learning models are student-centered learning models such as PjBL, PBL, DL, ORNE, Cooperative TGT, and guided inquiry. In addition, the use of ICT-based interactive media can improve learning outcomes, motivation and creativity of learners, also support the implementation of online learning well.

**Keywords:** Learning Models; Learning Media; Covid-19 Pandemic; Online Study

(\*) Corresponding Author: [iqbalainur19004@gmail.com](mailto:iqbalainur19004@gmail.com)

**How to Cite:** Rizki, I.A., Saphira, H.V., & Citra, N.F. (2022). Profiles of Learning Models and Media While Online Study During the Covid-19 Pandemic: A Literature Review. *Media Penelitian Pendidikan: Jurnal Penelitian dalam Bidang Pendidikan dan Pengajaran*, 16 (2): 287-302.

---

## **INTRODUCTION**

Every aspect of human's life, including education, has been affected by the Covid-19 pandemic. Every level of education, both primary and higher education, is also affected. So many schools are closed, and students' mobility has become limited in the home alone. This action is being taken to prevent the Covid-19 from spreading, particularly among students. The Indonesian Ministry of Education and Culture of takes a policy to conduct learning activities from their respective homes so that the learning process continues and students can gain knowledge properly (Ministry of Education and Culture, 2020). Furthermore, the government mandates that conventional teaching activities in schools be replaced with online learning platforms (Siahaan, 2020). This raises new problems where teachers and other teaching staff try to find other ways to achieve the learning goals that have been proclaimed before.

In connection with government policy, educators are required to design online distance learning systems. This learning system is a learning that is done without doing face-to-face, but through platforms or telecommunication devices such as mobile phones, tablets, and laptops (Firman & Rahman, 2020). Furthermore (Dabbagh & Ritland, 2005) says that two of the three essential components to online learning are the medium and online learning model.

Online learning media can be defined as a media that is equipped with a controller that the user can use to control and access what the user need (Atsani, 2020). This learning medium has several advantages, namely it can provide learning experiences through text, audio, video, and animation that is interesting and can see learning activities repeatedly. There are many media to choose from when learning, such as Whatsapp, Zoom, Zenius, Augmented Reality, and YouTube (Busa et al., 2020; Maphosa et al., 2020; Nurfitriana & Zulfah, 2020; Salim et al., 2020; Sintawana et al., 2020). However, each of these media has its effectiveness, advantages, and weaknesses. So educators need to master and know the selection of these media to be used in learning.

In addition to media, online learning also requires a certain learning model so that the purpose and syntax of learning become clear (Halimah, 2019). Therefore, online



learning cannot replace the conventional learning model completely but plays a role in strengthening certain learning models. This is because online learning is very difficult to control the psychological condition of students directly so that the learning is more oriented to students, such as problem-based learning and project-based learning (Arizona et al., 2020; Mulyani, 2020). So online learning system can help students inform learning independence.

Previous research conducted by (Ma'aruf et al., 2021; Pratama et al., 2020; Widayanti, 2021) only reviews learning common media, such as zoom, google classroom, WhatsApp, and google meet. However, there are many more recent interactive learning media such as Prezi, Kahoot!, and Quizizz. In addition, research by (Almanar, 2020; Bahasoan et al., 2020; Carrillo & Flores, 2020; Qowaid et al., 2020) only explains that online learning can improve students' abilities, such as critical thinking, cognitive, social, affective, and computational thinking. Thus, there needs to be a more in-depth investigation of the media and learning models used because both are the main aspects of carrying out the learning stages.

As a result, the goal of this research is to examine effective media and learning models, as well as their benefits and drawbacks, when utilized in online learning during the Covid-19 pandemic. This research is important to do so that the media and learning models can be known that can be used for educators following learning needs.

## **METHODS**

This research is a type of qualitative research with data collection techniques using the library research method. The first data is in 12 random journals containing nationally and internationally research results related to learning models and media used during the Covid-19 pandemic (2020-2021). After collecting the required data, the data is analyzed qualitatively descriptively (Rizki et al., 2021). This study generates a series of written statements that serve as descriptive analysis. According to Miles and Huberman (Sugiyono, 2017), the stages of analysis for qualitative research are generally depicted in Figure 1.

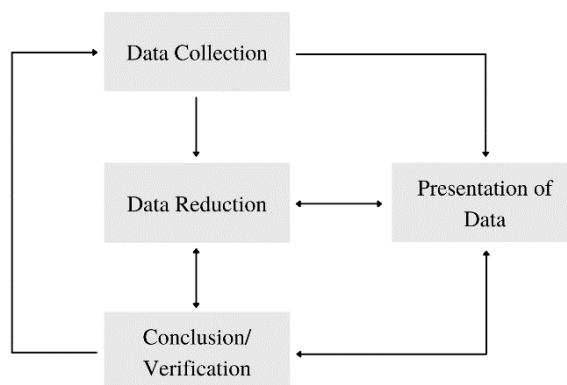


Figure 1. Stages of Qualitative Data Analysis in General (Sugiyono, 2017).

Activities in qualitative data analysis include four stages (Suliyannah et al., 2021), namely:

1. Data collection is obtaining data from various trusted sources to obtain the required information that supports the ability of research objectives.
2. Data reduction is sorting out important things focused on the needs of the author to facilitate obtaining the desired data in line with the research objectives
3. Presentation of data is the exposure of research data which is generally in the form of short descriptions, charts, relationships between subjects, and so on for qualitative research types
4. Conclusion and verification are the final results obtained after conducting a series of previous processes to attract new findings for the study's purpose.



**RESULT AND DISCUSSION**

**Result**

The literature review results of several studies on learning models used during pandemics can be seen in Table 1. The Table 1 shows twelve results of journal reviews that contain the title, research results, and conclusions of the research. In addition, there is also information about the learning model used in the study.

Table 1. The Results of A Literature Review of Learning Models in Online Learning

No	Source	Review	Learning Model
1.	(Yustina et al., 2020)	<p>Research Results: The experimental class's average creative thinking score was 91, with an N-gain index of 0.62, greater than the control class's (76, with an N-gain index of 0.51).</p> <p>Conclusion: The application of Blended Learning and Project-Based Learning is more effective than conventional learning in improving creative thinking skills.</p>	Project-Based Learning
2.	(Suriyanto & Wulandari, 2021)	<p>Research Results: In correspondence subjects, online learning with the PjBL model has proven effective, with four metrics of learning efficacy, namely the quality of learning, the level of learning, incentives, and time, all of which have been completed.</p> <p>Conclusion: Online learning with the Project-Based Learning model can be quite effective.</p>	Project-Based Learning
3.	(Ambarsari, 2020)	<p>Research Results: As the results of the pre-cycle study, the Midterm Assessment showed a completion of 41%. Then increase in cycle I and cycle II i.e., cycle I (63.6%) and cycle II (86.6%).</p> <p>Conclusion: The energetic discovery learning model on google classroom in online learning contributes real to improving student learning outcomes.</p>	Discovery Learning
4.	(Ketut et al., 2021)	<p>Research Results: Students' learning results in cycle I were 84.21 percent, with an average score of 73.42. Student learning outcomes improved to 89.47 percent in cycle II, with an average score of 79.37.</p> <p>Conclusion: In online learning, a cooperative learning model of the kind Teams Games Tournament (TGT) can increase the learning outcomes of grade VI elementary students in Sains subjects.</p>	Cooperative type Team Games Tournament
5.	(Lestari et al., 2021)	<p>Research Results: As evidenced by the fulfillment of participants' learning outcomes in pre-cycle by 42.3 percent, using online learning with the Discovery Learning</p>	Discovery Learning



No	Source	Review	Learning Model
		<p>model can increase student social subject learning outcomes. Learning increased in cycle I, with a completion rate of 65.4 percent. It then grew to 92.3 percent in cycle II.</p> <p>Conclusion: Students' learning outcomes can be improved by using Discovery Learning as online learning model.</p>	
6.	(Amalia & Hardini, 2020)	<p>Research Results: This learning model affected student learning outcomes shown from pretest results of 68.2 and post-tests of 75.8. In addition, the finding of the one-sample t-test obtained <math>t_{\text{count}} &gt; t_{\text{table}}</math> result &gt; 5%.</p> <p>Conclusion: Online learning in IPA subjects using Problem Based Learning model effectively improves the learning outcomes of grade V elementary students</p>	Problem Based Learning
7.	(Sarah, 2021)	<p>Research Results: Students' learning outcomes are improving with learning effectivity in the average category, according to a normalized gain score of 0.63. Furthermore, 80 percent of students finish all of their tasks on time.</p> <p>Conclusion: During online learning, discovery learning is an alternative way for providing meaningful learning and effectively increasing students' learning outcomes.</p>	Discovery Learning
8.	(Lorencia & Jatmiko, 2021)	<p>Research Results: In both groups, students' critical thinking skills differed considerably at <math>\alpha = 5\%</math> with average n-gain scores in the moderate and consistent categories.</p> <p>Conclusion: Online learning which combines PBL with an effective STS strategy can improve students' critical thinking skills in high school.</p>	Problem-Based Learning
9.	(Prahani et al., 2020)	<p>Research results: The average N-gain of PSS of physics bachelor candidates was higher after online learning with the ORNE and conventional online learning models.</p> <p>Conclusion: The ORNE learning model was found to be beneficial in increasing the problem-solving abilities of physics bachelor candidates.</p>	ORNE (Orientation, Routine Problem Solving, Non-Routine Problem Solving, Evaluation)



No	Source	Review	Learning Model
10.	(Diarini et al., 2020)	<p><b>Research Results:</b> There was an increase in critical thinking ability by 72.5% in cycle I (good category) to 88.3% in cycle II (excellent category). The average learning outcome of cycle I is 79.7% (good category) and cycle II by 80.8% (good category).</p> <p><b>Conclusion:</b> The implementation of the PjBL learning model based on online lesson study can improve students' critical thinking skills with excellent categories and results with good categories.</p>	Project-Based Learning
11	(Rohaili et al., 2021)	<p><b>Research Results:</b> The MANOVA hypothesis test revealed that the usage of online media to deliver teaching materials guided by integrated local wisdom based on educational outcomes had an impact on learners' science literacy.</p> <p><b>Conclusion:</b> The use of online media to deliver educational materials guided by integrated inquiry models of local wisdom has an impact on learners' science literacy.</p>	Guided Inquiry
12	(Ishma & Novita, 2021)	<p><b>Research Results:</b> The learning outcomes of the cognitive realm of students of class XI MIPA 5 at MAN Surabaya obtained a grade of <math>\geq 75</math> were declared complete with an average score of 86.</p> <p><b>Conclusion:</b> Students' critical thinking skills improve and student learning is completed 100% of the time.</p>	Guided Inquiry

The usefulness and advantages of the learning model based on the literature review results at the time of online study can be seen in Table 2.

Table 2. Description of The Learning Model Found Based on The Results of The Literature Review

Learning Model	Description
PjBL	Project-based learning is suitable because the teacher is only tasked with guiding, monitoring, and evaluating the results of projects developed by students. While students can find and develop their knowledge and apply it in projects created (Ergül & Kargın, 2014). But this model has disadvantages in that it takes a lot of time and is quite costly. Teachers will also have difficulty in supervising the development of student projects.
DL	Discovery-based learning is relevant to apply during online learning because the teacher does not actively explain the material to the student. Still, the teacher only provides several questions, and the student must find, investigate, and conclude the results of their findings to answer the teacher's questions (Fitriyah et al., 2017). But



Learning Model	Description
	this learning also has the disadvantage of being prone to the formation of misconceptions experienced by students.
PBL	Problem-based learning is suitable for online learning because the teacher only provides stimulation and initial knowledge about the provided material. Then, the students can develop their own knowledge of the problem that must be solved (Tanti, 2020). However, this model also has a disadvantage; if the students do not have confidence, the students will be reluctant in the process of solving problems.
ORNE	ORNE is an online learning model that focuses on improving problem-solving abilities. This learning model is very suitable for the online learning period because it integrates with various familiar media, such as Whatsapp, Youtube, and PhET, to act as facilitators. (Prahani et al., 2020). However, the drawback is not all students and teachers have good internet connections and proper devices. In addition, the relevant research only uses a sample of physics bachelor candidates, not school students.
Cooperative TGT	Cooperative TGT is a cooperatively learning model with tournament mode. This learning model can be a breakthrough effort for teachers in organizing online learning activities that are more fun for students (M. Hikmah et al., 2018). However, cooperative learning during a pandemic is particularly vulnerable to group members who do not help or collaborate with others.
Guided Inquiry	Inquiry-based learning of scientific questions (Peranginangin, 2021) can be one of the online learning models because it is oriented to students' activities in adjudging questions and conducting independent investigations to find the answers (Peranginangin, 2021). Teachers are obliged to guide students in the process of investigative activities. However, this learning model has the disadvantage of not being applicable in all subject materials.

The literature review results on some of the learning media used during the pandemic can be seen in Table 3. The Table 3 shows twelve results of journal reviews that contain the title, research results, and conclusions of the research. In addition, there is also information about the learning media used in the study.

Table 3. The Results of A Literature Review of The Medium of Learning on Online Learning

No.	Source	Review	Learning Media
1	(Wang & Tahir, 2020)	<p>Research Results: Kahoot! has a positive effect on learning when compared to traditional media and other learning media. It can increase teacher and student interaction, have a positive perception for students, and encourage student participation in the classroom.</p> <p>Conclusion: As a learning media, Kahoot! has a positive impact on learning.</p>	Kahoot!
2	(Heartburn, 2020)	<p>Research Results: The overall online activity obtained an average of 79.21 students' chemistry knowledge scores and</p>	Google Classroom, Google



No.	Source	Review	Learning Media
		<p>the percentage of students who have exceeded KKM by 77.25%. Minimum completion criteria of chemical knowledge applied from SMAN 1 Banguntapan by 78, and the percentage of students who have exceeded KKM more than 75%.</p> <p>Conclusion: Online learning on chemistry subjects in class XI MIPA SMAN 1 Banguntapan is effectively implemented.</p>	Form and Quizizz.
3	(Rosmiati & Siregar, 2021)	<p>Research results: The students' reaction to Prezi-Powerpoint was positive as presentation's development of interactive learning media. The average percentage of the feasibility of developing this media is suitable for usage with good interpretation, according to the learning media feasibility test.</p> <p>Conclusion: Prezi and PowerPoint presentations can also be used as interactive learning tools for students.</p>	Prezi
4	(Ermila Mahariyanti, 2020)	<p>Research Results: The experimental class post-test score is higher than the control class, at 81.5 in the experimental class and 77.1 in the control class; the value of sig. &lt; 0.05 (0.003 &lt; 0.05) can also be seen from the T-test findings.</p> <p>Conclusion: The application of Blended Learning using Quipper for biology subjects in class XI MIPA SMAN 2 Selong has effective students' learning outcomes.</p>	Media Quipper School.
5	(Amirullah et al., 2021)	<p>Research Results: The validation results acquired by media experts and material experts strongly agree with each other, including media experts agreeing 85% of the time and material experts agreeing 92% of the time. The teacher then conducted a media feasibility test, which yielded 89% agreement on the criteria.</p> <p>Conclusion: Product trials with 21 students at SDS Muhammadiyah 9 Jakarta were used to assess the students' ability to use media products. The results showed that 86 percent of the criteria were strongly agreed upon.</p>	Millealab Virtual Reality
6	(Shepa et al., 2021)	<p>Research Results: It received an 87.82 percent score based on the results of surveys submitted to teachers in this VR-based learning media. According to the results of the survey, VR-based learning media can be used.</p> <p>Conclusion:</p>	Virtual Reality-based Learning



No.	Source	Review	Learning Media
		Virtual-Reality-based learning media based on electromagnetic wave radiation materials could be employed as a future source of learning for pupils.	
7	(S. Wisdom, 2020)	<p>Research Results: Students who feel suitable and happy with the utilization of E-Learning Madrasah 96.99% and who 3.01%. While the activities of teachers and students in the Madrasah E-Learning application in August 2020 have an average percentage of more than 75% in a positive direction.</p> <p>Conclusion: The utilization of Madrasah E-Learning application for online learning in MIN 1 Rembang in august presents effective and acceptable results and is followed by most learning actors.</p>	Media Directorate of KSKK Madrasah (Website)
8	(Elga & Dewi, 2020)	<p>Research Results: For experiment courses, learning harpability increased by 91.66%, but for control classes, it increased by 62.85%. The experimental class's average N-gain grade is 0.87, while the control class's average N-gain grade is 0.67.</p> <p>Conclusion: In class X MIPA, employing online media in E-learning produces more effective results than learning without it.</p>	E-Learning uses website media
9	(Safarati & Rahma, 2020)	<p>Research Results: Three students are at the top of the class, each with a score of 10790 and a 100% accuracy rate. Then there are 7 students who score 90% accuracy, 2 students who score 80% accuracy, 2 students who score 70% accuracy, and 1 student who scores 10% accuracy.</p> <p>Conclusion: During the Covid-19 pandemic, Quizziz Education Game's online learning material produced the best outcomes for practical physics classes.</p>	Quizziz Education Game Media.
10	(Syafei et al., 2020)	<p>Research Results: STEM-based e-learning materials According to media experts, Schoology is 86 percent viable and 83 percent feasible according to IT specialists. The findings of teacher and student trials reveal percentages of 90% and 92.5%, respectively, which falls into the "very attractive" category.</p> <p>Conclusion: This learning media is quite practicable and acceptable for classroom application.</p>	Schoology
11	(Subandowo et al., 2020)	<p>Research Results: <math>H_0</math> is rejected due to the measured price <math>t = -9,640</math> with <math>df</math> 39 and important number or value <math>p</math> 0.000</p>	Media Moodle.





No.	Source	Review	Learning Media
		<p>&lt; 0.05. It claims that while using Moodle blended-learning in elementary school education infrastructure during the Covid-19 pandemic, there are considerable differences.</p> <p>Conclusion: During the COVID-19 pandemic, the usage of Moodle blended-learning model in elementary school was effective and can be used as an e-learning solution.</p>	
12	(Hadjarati et al., 2020)	<p>Research Results: The analysis revealed that students' creative thinking skills have improved, as demonstrated by the average value of N-Gain of 0.70, which falls into the high group.</p> <p>Conclusion: E-learning utilizes Edmodo effectively to improve students' creative thinking of grade X IPA Wira Bhakti Gorontalo material momentum and impulse.</p>	Media Edmodo.

The use of those media in Table 3 can improve learning outcomes, motivation, the creativity of learners and can be more interactive to facilitate students as a supporting media for online learning during Covid-19 outbreaks. The description of each of these media is represented in Table 4.

Table 4. Description of Learning Media Found Based on The Results of Literature Review

Learning Media	Function
Kahoot!	Kahoot! is gamification-based learning media that can provide multiple choice quizzes and identify student knowledge as a form of pre-assessment, formative, review, strengthening, and problem training (Baszuk & Heath, 2020). This media can be applied during online learning because of its easily accessible use both through websites and applications.
Quizizz	Quizizz is a website that allows you to create interactive quiz games for use as a learning tool. This media can be one of the alternatives to the implementation of tests, competitions, or interesting assessments during online learning for all levels of education (N. Hikmah et al., 2021). In addition, this media is also open access, free, and easily accessible for the teachers and students.
Prezi	Prezi is software for creating presentations and sharing ideas interactively. This platform is superior because it uses the concept of a Zooming User Interface and can be free-accessed (Rahman et al., 2020). But some users have difficulty using this media because it is less familiar.
Quipper	Quipper School is a open-source Learning Management System (LMS) site that offers a variety of learning videos for students of all levels. It can increase the flexibility of teaching and learning outside the classroom for both teachers and participants to replace the physical presence of teachers to teach in the classroom (El Iq Bali et al., 2021).



Learning Media	Function
	Furthermore, light language delivery and a relaxed way of teaching make students happy and enjoy the presented learning videos.
Millealab Virtual Reality-Based	Millealab is one of the platforms that can assist teachers in creating learning media utilizing Virtual Reality (VR) technology (Agusty & Anggaryani, 2021). Millealab's virtual reality allows people to participate in a computer-simulated environment. Thus, students will more easily imagine the phenomena in learning and feel more interested in learning materials during online learning (Dewi, 2020). But virtual reality is not easy to implement because of its difficult use and less familiar construction.
Website Based Learning	Website-based learning is appropriate for online learning since it allows for schedule flexibility, classes can be accessible from anywhere on the internet, and the learning process becomes more efficient (Serevina & Meyputri, 2021). In addition, the use of the website can provide flexibility for teachers to arrange a model or appearance of the website that they will use as a learning medium. The use of website-based learning also provides convenience for students to access learning media without downloading any application.
Moodle	Moodle, which stands for 'Modular Object-Oriented Dynamic Learning Environment,' is a web-based Learning Management System (LMS) that was created to facilitate the learning process and is freely available as open-source software. Moreover, it is integrated with hybrid teaching and learning, so it suits for application during online learning.
Edmodo	Edmodo is a learning management system (LMS) platform that can be used to create learning materials and evaluate the systems so that students' learning progress can be tracked in e-learning media. In addition, Edmodo is considered to support 21 <sup>st</sup> -century education by integrating with various learning activities such as task workmanship, quiz exams, and others. Edmodo in integration pedagogy positively impacts students' academic achievement (Ryane & el Faddouli, 2020).

**Discussion**

Project-Based Learning (PjBL), Discovery Learning (DL), Problem Based Learning (PBL), ORNE, Cooperative Team Games Tournament (TGT), and Guided Inquiry were identified to be some online learning research models based on the results of the literature review. The entire learning models can mostly improve student learning outcomes. A small percentage of others, such as PjBL, can improve creative and critical thinking skills, while PBL and inquiry can also improve students' critical thinking and science literacy skills, also ORNE learning model can improve students' problem-solving abilities. These increases in student learning outcomes are due to the learning models that are more centered on students to improve their cognitive aspects (Iswandari, 2020). It follows Piaget's constructivism learning theory, which claims that via active information processing, a learner constructs knowledge for himself (Utami, 2016). It is also supported by research (Utami & Muqowim, 2020; Wilson, 2020) which shows that in times of pandemic, learning systems have shifted to be centralized to the students because they are more expert in using information and communication technology. In addition, during the online learning period, the available time for teaching and learning activities becomes cut off, so the learning models such as direct learning are considered less effective.

Therefore, PjBL, PBL, DL, ORNE, Cooperative TGT, and Guided Inquiry are examples of student-centered learning methods that can be used during online learning



if teachers are having trouble increasing student learning outcomes (Guo et al., 2020; Mukti et al., 2020; Silalahi & Hutauruk, 2020; Syakur & Sabbath, 2020; Widyaningsih & Yusuf, 2020). Moreover, responding to the online learnings mostly done asynchronously, the learning models will be more effective if they focus on students. Nevertheless, teachers must also provide preliminary knowledge to the students to develop initial knowledge into their new discoveries. In addition, the learning models mentioned above are also relevant to the demands of the latest curriculum and 21<sup>st</sup>-century learning (Muhtarom & Kurniasih, 2020).

### ***Literature Review on Learning Media***

Table 2 shows data and literature review analysis in several references. During the Covid-19 pandemic, the use of online learning media based on Information and Communication Technology (ICT) such as Kahoot!, Quizizz, Prezi, Millealab Virtual Reality-Based Learning, Directorate of KSKK Madrasah, website, Schoology, Moodle, Quipper School, and Edmodo showed positive results in early elementary to high school students.

Based on Table 2, we agree that students can get benefit from using online-based learning media as a source of information. According to the findings of the study, the development of online learning media in specific platforms has been shown to increase student learning outcomes during the Covid-19 era. The use of these platforms can be one of the alternative learning media that attract the interest and attention of the students. The usage of media has been shown to aid in the reinforcement of students' concept understanding in learning. However, one of the ways to attract learners' attention in learning is using innovative learning media and as much as possible similar to what is in our everyday life (Dhawan, 2020).

In the Covid-19 pandemic situation, learning media development needs to improve learners' understanding of where it must represent interested learning (Suliyannah et al., 2021). Learning development through online and blended learning can improve students' motivation, learning outcomes, and concept understanding. The application of online learning and blended learning media has advantages related to the flexibility of learners to playback the presented learning in anytime and anywhere. Nonetheless, there are main obstacles when using ICT-based learning media, such as inadequate devices, lack of digital technology and a less stable internet network (Bączek et al., 2021; Fikri et al., 2021).

Overall, the internet period's utilization of learning models and media differs from traditional learning. Because learning activities are carried out through devices, it requires integration between models and ICT-based learning material. Furthermore, the use of the learning model should be student-oriented so the students can seek their own knowledge through the used learning media. Therefore, both teachers and students must be capable of using information technology so that the learning process can run well.

This study has a limitation in the articles number that has been identified, which only provides twelve pieces both for models and media. In addition, the results of the literature review still cover the level of education as a whole structure, ranging from primary education to higher education. The level of education greatly influences the determination of the learning models and media use. Nonetheless, this study is useful for teachers in choosing appropriate learning model and media for online learning. Although pandemic has begun to be controlled in some areas, online learning and e-learning consider as future education systems that are not limited by space and time.

### **CONCLUSION**

According to the literature study results, we managed to find relevant learning models applied during online learning, namely PjBL, PBL, DL, ORNE, Cooperative TGT, and Guided Inquiry. On the other hand, we also found interactive learning media such as Kahoot!, Quizizz, Prezi, Quipper, Milealab Virtual Reality, Website-based Learning, Moodle, and Edmodo, which provide ICT-based media. Each model and media have



advantages and disadvantages. Therefore, educators need to adjust between teaching needs and the type of model and learning media used. Recommendations are submitted to the next researcher to conduct a more specific literature review on the type of learning model or media following the subject, education level, and curriculum used.

## REFERENCES

- Agusty, A. I., & Anggaryani, M. (2021). Teaching Global Warming with Millealab Virtual Reality. *Jurnal Pendidikan Fisika*, 9(2), 134–144. <https://doi.org/10.26618/jpf.v9i2.5084>
- Almanar, M. A. (2020). The Shifting of Face To Face Learning To Distance Learning During The Pandemic Covid-19. *Globish (An English-Indonesian Journal for English, Education and Culture)*, 9(2), 76–83.
- Amalia, G. R., & Hardini, A. T. A. (2020). Efektivitas Model Problem Based Learning Berbasis Daring terhadap Hasil Belajar IPA Kelas V Sekolah Dasar. *Jurnal Ilmiah Wahana Pendidikan*, 6(3), 424–431. <https://doi.org/10.5281/zenodo.3977422>
- Ambarsari, T. (2020). Upaya Peningkatan Hasil Belajar Peserta Didik Dengan Model Discovery Learning Melalui Google Classroom Di Sma Negeri 1 Bayat. *Habitus: Jurnal Pendidikan, Sosiologi, & Antropologi*, 4(1), 109. <https://doi.org/10.20961/habitus.v4i1.45776>
- Amirullah, G., Purnomo, A., & Aji, G. B. (2021). Development of Android-Based Millealab Virtual Reality Media in Natural Science Learning. *Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education)*, 9(1), 1–10. <https://doi.org/10.24815/jpsi.v9i1.18218>
- Arizona, K., Abidin, Z., & Rumansyah, R. (2020). Pembelajaran Online Berbasis Proyek Salah Satu Solusi Kegiatan Belajar Mengajar Di Tengah Pandemi Covid-19. *Jurnal Ilmiah Profesi Pendidikan*, 5(1), 64–70. <https://doi.org/10.29303/jipp.v5i1.111>
- Atsani, L. G. M. Z. (2020). Transformasi Media Pembelajaran Pada Masa Pandemi Covid-19. *Al-Hikmah: Jurnal Studi Islam*, 1(1), 82–93.
- Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., & Woźakowska-Kapłon, B. (2021). Student's Perception of Online Learning during COVID-19 Pandemic. *Medicine*, 100(7), 1–6. <https://doi.org/10.1007/s12098-020-03327-7>
- Bahasoan, A. N., Wulan Ayuandiani, Muhammad Mukhram, & Aswar Rahmat. (2020). Effectiveness of Online Learning In Pandemic Covid-19. *International Journal of Science, Technology & Management*, 1(2), 100–106. <https://doi.org/10.46729/ijstm.v1i2.30>
- Baszuk, P. A., & Heath, M. L. (2020). Using Kahoot! to increase exam scores and engagement. *Journal of Education for Business*, 95(8), 548–552. <https://doi.org/10.1080/08832323.2019.1707752>
- Busa, Y., Agusriandi, A., Elihami, E., & Mutmainnah, M. (2020). Facing Covid-19 in Indonesia: Variations of Learning Media and Online Teaching Learning Through You Tube and Zoom Application. *Journal of Critical Reviews*, 7(19), 7427–7432.
- Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: a literature review of online teaching and learning practices. *European Journal of Teacher Education*, 43(4), 466–487. <https://doi.org/10.1080/02619768.2020.1821184>
- Dabbagh, N., & Ritland, B. B. (2005). *Online Learning: Concepts, Strategies and Application*. Pearson Prentice Hall.
- Dewi, R. K. (2020). Pemanfaatan Media 3 Dimensi Berbasis Virtual Reality Untuk Meningkatkan Minat Dan Hasil Belajar Ipa Siswa Kelas V Sd. *Jurnal Pendidikan*, 21(1), 28–37. <https://doi.org/10.33830/jp.v21i1.732.2020>
- Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Diarini, I. G. A. A. S., Ginting, M. F. B., & Suryanto, I. W. (2020). Penerapan Model Pembelajaran Project Based Learning Berbasis Lesson Study Melalui



- Pembelajaran Daring Untuk Mengetahui Kemampuan Berfikir Kritis Dan Hasil Belajar. *Ganaya: Jurnal Ilmu Sosial Dan Humaniora*, 3(2), 253–265.
- El Iq Bali, M. M., Zamroni, Umar, Musthofa, B., Sulistiani, I. R., Dewi, M. S., Baharun, H., & Abdullah, D. (2021). The Effect of Quipper School Assisted Blended Learning (QSBL) on Student Motivation and Interest in Learning. *Journal of Physics: Conference Series*, 1899(1). <https://doi.org/10.1088/1742-6596/1899/1/012154>
- Elga, B., & Dewi, K. (2020). Efektivitas Penggunaan Media E-learning Berbasis Website Terhadap Hasil Belajar Kognitif Peserta Didik. *Chemistry in Education*, 9(2), 77–82.
- Ergül, N. R., & Kargın, E. K. (2014). The Effect of Project based Learning on Students' Science Success. *Procedia - Social and Behavioral Sciences*, 136, 537–541. <https://doi.org/10.1016/j.sbspro.2014.05.371>
- Ermila Mahariyanti, S. H. (2020). Efektivitas Penggunaan Blended Learning dengan Platform Quipper School terhadap Hasil Belajar Peserta Didik Mata Pelajaran Biologi Kelas XI MIPA di SMAN 2 Selong. *Jurnal Ilmiah Wahana Pendidikan*, 6(4), 911–920. <https://doi.org/10.5281/zenodo.4314057>
- Fikri, M., Ananda, M. Z., Faizah, N., Rahmani, R., Elian, S. A., & Suryanda, A. (2021). Kendala Dalam Pembelajaran Jarak Jauh di Masa Pandemi Covid-19 : Sebuah Kajian Kritis. *Jurnal Education and Development*, 9(1), 145–148. <http://journal.ipts.ac.id/index.php/ED/article/view/2290>
- Firman, F., & Rahman, S. R. (2020). Pembelajaran Online di Tengah Pandemi Covid-19. *Indonesian Journal of Educational Science (IJES)*, 2(2), 81–89. <https://doi.org/10.31605/ijes.v2i2.659>
- Fitriyah, F., Murtadlo, A., & Wartu, R. (2017). Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Matematika Siswa MAN Model Kota Jambi. *Jurnal Pelangi*, 9(2), 108–112. <https://doi.org/10.47668/pkwu.v7i1.20>
- Guo, P., Saab, N., Post, L. S., & Admiraal, W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102, 101586. <https://doi.org/10.1016/j.ijer.2020.101586>
- Hadjarati, Y. A., Arota, A. S., Mursalin, & Odja, A. H. (2020). Effectiveness of edmodo to improve senior high school students' creative thinking skills in momentum and impulse topics. *Journal of Physics: Conference Series*, 1521(2). <https://doi.org/10.1088/1742-6596/1521/2/022065>
- Halimah, S. (2019). Desain Pembelajaran Berbasis Blended-Learning di Perguruan Tinggi. *Prosiding Seminar Nasional Fakultas Ilmu Sosial Universitas Negeri Medan*, 3, 680–685.
- Hikmah, M., Anwar, Y., & Riyanto. (2018). Penerapan Model Pembelajaran Team Games Tournament (TGT) Terhadap Motivasi dan Hasil Belajar Peserta Didik pada Materi Dunia Hewan Kelas X di SMA Unggul Negeri 8 Palembang. *Jurnal Pembelajaran Biologi*, 5(1), 56–73.
- Hikmah, N., Putri, N. A., Nisa', K., & Jauhariyah, M. N. R. (2021). Using Quizizz to Develop an Assessment of Physics Learning: An Alternative Way for Physics Learning Assessment in the Covid-19 Pandemic Era. *Journal of Physics: Conference Series*, 1805(1), 1–12. <https://doi.org/10.1088/1742-6596/1805/1/012021>
- Hikmah, S. (2020). Efektifitas E-Learning Madrasah dalam Pelaksanaan Pembelajaran Jarak Jauh Masa Pandemi Coronavirus Disease 2019 (Covid-19) di MIN 1 Rembang. *Jurnal Edutraind: Jurnal Pendidikan Dan Pelatihan*, 4(2), 73–85. <https://doi.org/10.37730/edutraind.v4i2.81>
- Ishma, E. F., & Novita, D. (2021). Keterampilan Berpikir Kritis Siswa MAN Surabaya Materi Faktor Laju Reaksi dengan Inkuiri Terbimbing Online. *Chemistry Education Practice*, 4(1), 10. <https://doi.org/10.29303/cep.v4i1.2272>



- Iswandari, Y. (2020). Peningkatan hasil belajar pembelajaran daring melalui model project based learning berbantu platform zoom meeting. *Journal of Chemical Information and Modeling*, 3(3), 187–194.
- Kementerian Pendidikan dan Kebudayaan. (2020). *Surat Edaran Nomor 4 Tahun 2020 Tentang Pelaksanaan Pendidikan dalam Masa Darurat CoronaVirus (COVID-19)*.
- Ketut, G., Pramana, T., & Cintiasa, G. P. (2021). Penerapan Pembelajaran Daring Berbasis Model Teams Game Tournament Meningkatkan Hasil Belajar IPA. 4(1), 118–124.
- Lestari, D. E., Koeswanti, H. D., & Sadono, T. (2021). Penerapan Pembelajaran Daring Model Discovery Learning untuk Meningkatkan Hasil Belajar IPS di Sekolah Dasar. *Jurnal Basicedu*, 5(2), 842–849. <https://doi.org/10.31004/basicedu.v5i2.841>
- Lorencia, G., & Jatmiko, B. (2021). Online Learning PBL Model with the STS Approach to Improve High School Students' Critical Thinking Ability. *PENDIPA Journal of Science Education*, 5(3), 459–465. <https://doi.org/10.33369/pendipa.5.3.459-465>
- Ma'aruf, M., Setiawan, A., Suhandi, A., & Siahaan, P. (2021). Trends in the Development of Physics Learning Multimedia in Indonesia: A Literature Review. *Jurnal Pendidikan Fisika*, 9(3), 185–192. <https://doi.org/10.26618/jpf.v9i3.5853>
- Maphosa, V., Dube, B., & Jita, T. (2020). A UTAUT evaluation of whatsapp as a tool for lecture delivery during the COVID-19 lockdown at a Zimbabwean University. *International Journal of Higher Education*, 9(5), 84–93. <https://doi.org/10.5430/ijhe.v9n5p84>
- Muhtarom, H., & Kurniasih, D. (2020). Pengaruh Model Pembelajaran Abad 21 Terhadap Pembelajaran Sejarah Eropa. *Bihari: Pendidikan Sejarah Dan Ilmu Sejarah*, 3(2), 59–65.
- Mukti, Y. P., Masykuri, M., Sunarno, W., Rosyida, U. N., Jamain, Z., & Dananjoyo, M. D. (2020). Exploring the Impact of Project-Based Learning and Discovery Learning to The Students' Learning Outcomes: Reviewed from The Analytical Skills. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, 9(1), 121–131. <https://doi.org/10.24042/jipfalbiruni.v9i1.4561>
- Mulatsih, B. (2020). Application of Google Classroom, Google Form and Quizizz in Chemical Learning During the Covid-19 Pandemic. *Ideguru: Jurnal Karya Ilmiah Guru*, 5(1). <https://doi.org/10.51169/ideguru.v5i1.129>
- Mulyani, S. (2020). Penerapan Metode Pembelajaran Problem Based Learning Guna Meningkatkan Hasil Belajar IPA Di Masa Pandemi Covid 19. *Navigation Physics : Journal of Physics Education*, 2(2), 84–89. <https://doi.org/10.30998/npjpe.v2i2.489>
- Nurfitriana, N., & Zulfah, Z. (2020). Penerapan E-Learning dengan Aplikasi Zenius untuk Meningkatkan Motivasi Belajar Siswa SMP Negeri 2 Kampar Utara. *Journal on Education*, 3(1), 62–75.
- Peranginangin, R. B. (2021). Penerapan Model Inquiry Learning Terhadap Hasil Belajar Siswa Pada Mata Pelajaran Pendidikan Kewarganegaraan (PKn) Di Kelas VI SD Negeri 040527 Tigapanah Semester II T.P 2019 / 2020. *Bina Gogik*, 8(2), 38–47.
- Prahani, B. K., Ramadani, A. H., Kusumawati, D. H., Suprpto, N., Madlazim, M., Jatmiko, B., Supardi, Z. A. I., Mubarok, H., Safitri, S., & Deta, U. A. (2020). ORNE Learning Model to Improve Problem-Solving Skills of Physics Bachelor Candidates: An Alternative Learning in the Covid-19 Pandemic. *Jurnal Penelitian Fisika Dan Aplikasinya (JPFA)*, 10(1), 71. <https://doi.org/10.26740/jpfa.v10n1.p71-80>
- Pratama, H., Azman, M. N. A., Kassymova, G. K., & Duisenbayeva, S. S. (2020). The Trend in Using Online Meeting Applications for Learning During the Period of Pandemic COVID-19: A Literature Review. *Journal of Innovation in Educational and Cultural Research*, 1(2), 58–68. <https://doi.org/10.46843/jiecr.v1i2.15>
- Qowaid, Q., Junaedi, D., Romli, M., & Primarni, A. (2020). Analisis Persepsi Civitas Akademika Terhadap Implementasi Perkuliahan E-Learning Selama Pandemi



- Covid-19: *Reslaj: Religion Education Social Laa Roiba Journal*, 2(2), 114–141. <https://doi.org/10.47467/reslaj.v2i2.144>
- Rahman, F., Ratna, S., Wagino, W., & Alamsyah, N. (2020). Pelatihan Pembuatan Presentasi Interaktif Menggunakan Prezi Pada Guru di SD IT Anak Sholeh Mandiri Banjarmasin. *Jurnal Pengabdian Al-Ikhlas*, 6(2), 175–180.
- Rizki, I. A., Bintoro, H., Nisa', K., Rahman, P., Realita, A., & Deta, U. A. (2021). Profile of community understanding and literacy about disaster risk mitigation: The responses of java south coast community against megathrust earthquake and tsunami prediction. *Jurnal GeoEco*, 7(3), 294–308.
- Rohaili, J., Setiadi, D., & Kusmiyati, K. (2021). Pengaruh Penerapan Bahan Ajar Model Inkuiri Terbimbing Terintegrasi Kearifan Lokal Berbasis Outcome Based Education (OBE) Melalui Penggunaan Media Online Terhadap Literasi Sains. *Jurnal Pijar Mipa*, 16(2), 157. <https://doi.org/10.29303/jpm.v16i2.2379>
- Rosmiati, U., & Siregar, N. (2021). Promoting Prezi-PowerPoint presentation in mathematics learning: The development of interactive multimedia by using ADDIE model. *Journal of Physics: Conference Series*, 1957(1). <https://doi.org/10.1088/1742-6596/1957/1/012007>
- Ryane, I., & El Faddouli, N. E. (2020). A case study of using edmodo to enhance computer science learning for engineering students. *International Journal of Emerging Technologies in Learning*, 15(3), 62–73. <https://doi.org/10.3991/ijet.v15i03.11252>
- Safarati, N., & Rahma, R. (2020). The Effectiveness of Online Learning Using Quizizz Education Game Media During the Covid-19 Pandemic in Applied Physics Courses. *Indonesian Review of Physics*, 3(2), 52. <https://doi.org/10.12928/irip.v3i2.3049>
- Salim, S., Darmawan, F. A., & Jainuddin, J. (2020). Augmented Reality-based Mathematics Worksheet for Online Learning During Covid-19 Pandemic. *Indonesian Journal of Educational Studies*, 23(2), 81–89.
- Sarah, L. L. (2021). The implementation of discovery learning using personal site in physics online classroom. *Journal of Physics: Conference Series*, 1957(1). <https://doi.org/10.1088/1742-6596/1957/1/012042>
- Serevina, V., & Meyputri, C. U. (2021). Development of blended learning based on website on fluid mechanic material to improve students' creative thinking skills. *Journal of Physics: Conference Series*, 1876(1). <https://doi.org/10.1088/1742-6596/1876/1/012070>
- Shepa, M. J., Serevina, V., & Astra, I. M. (2021). Development of virtual reality-based learning media on electromagnetic wave radiation material. *Journal of Physics: Conference Series*, 1876(1), 1–10. <https://doi.org/10.1088/1742-6596/1876/1/012088>
- Siahaan, M. (2020). Dampak Pandemi Covid-19 Terhadap Dunia Pendidikan. *Jurnal Kajian Ilmiah*, 1(1), 73–80. <https://doi.org/10.31599/jki.v1i1.265>
- Silalahi, T. F., & Hutauruk, A. F. (2020). The Application of Cooperative Learning Model during Online Learning in the Pandemic Period. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 3(3), 1683–1691. <https://doi.org/10.33258/birci.v3i3.1100>
- Sintawana, N., Lazirkha, D. P., & Sari, S. N. (2020). Pengaruh Media Pembelajaran Online Berbasis E-learning pada Aplikasi Zenius terhadap Hasil Belajar Siswa SMA. *Jl-Tech*.
- Subandowo, M., Asri Humaira, M., Rusmiati Aliyyah, R., Rachmadtullah, R., Samsudin, A., & Nurtanto, M. (2020). Use of Blended Learning with Moodle: Study Effectiveness in Elementary School Teacher Education Students during The COVID-19 pandemic. *International Journal of Advanced Science and Technology*, 29(7), 3272–3277.
- Sugiyono, S. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Suliyannah, Deta, U. A., Kurniawan, F. K., Lestari, N. A., Yantidewi, M., Jauhariyah, M. N. R., & Prahani, B. K. (2021). Literature Review on the Use of Educational



- Physics Games in Improving Learning Outcomes. *Journal of Physics: Conference Series*, 1805(1). <https://doi.org/10.1088/1742-6596/1805/1/012038>
- Suriyanto, F. N., & Wulandari, S. S. (2021). Analysis of the Effectiveness of Online Learning With Pjbl Model in Correspondence Subjects. *Paedagogia: Jurnal Kajian, Penelitian dan Pengembangan Kependidikan*, 12(1), 106–114.
- Syafei, I., Saregar, A., Hairul, H., Thahir, A., Sari, P. M., & Anugrah, A. (2020). E-learning with STEM-Based Schoology on Static Fluid Material. *Journal of Physics: Conference Series*, 1467(1). <https://doi.org/10.1088/1742-6596/1467/1/012052>
- Syakur, A., & Sabat, Y. (2020). The Effectiveness of Coopertative Learning (STAD and PBL type) on E-learning Sustainable Development in Higher Education. *Journal of Development Research*, 4(1), 53–61.
- Tanti, T. (2020). Konstruksi dan Validasi Bahan Ajar Fisika Berbasis Problem-Based Learning (PBL) untuk Meningkatkan Keterampilan Generik Siswa. *Journal of Teaching and Learning Physics*, 5(1), 28–34. <https://doi.org/10.15575/jotalp.v5i1.6635>
- Utami, I. G. A. L. P. (2016). Teori Konstruktivisme dan Teori Sosiokultural: Aplikasi dalam Pengajaran Bahasa Inggris. *Prasi*, 11(01), 4–11.
- Utami, V. A., & Muqowim, M. (2020). Pengintegrasian Nilai-Nilai Keislaman Dengan Pembelajaran TIK (Teknologi Informasi Dan Komunikasi) Pada Siswa Sekolah Dasar. *JEMARI (Jurnal Edukasi Madrasah Ibtidaiyah)*, 2(2), 76–83. <https://doi.org/10.30599/jemari.v2i2.665>
- Wang, A. I., & Tahir, R. (2020). The effect of using Kahoot! for learning – A literature review. *Computers and Education*, 149, 103818. <https://doi.org/10.1016/j.compedu.2020.103818>
- Widayanti, W. (2021). Online Learning Media on Science Learning during the COVID-19 Pandemic: A Literature Study in Indonesia. *Online Learning in Educational Research*, 1(1), 55–61.
- Widyaningsih, S. W., & Yusuf, I. (2020). Implementation of project-based learning (PjBL) assisted by e-learning through lesson study activities to improve the quality of learning in physics learning planning courses. *International Journal of Higher Education*, 19(1), 60–68. <https://doi.org/10.5430/ijhe.v9n1p60>
- Wilson, A. (2020). Penerapan Metode Pembelajaran Daring (Online) melalui Aplikasi Berbasis Android saat Pandemi Global. *SAP (Susunan Artikel Pendidikan)*, 5(1), 66–72. <https://doi.org/10.30998/sap.v5i1.6386>
- Yustina, Syafii, W., & Vebrianto, R. (2020). The effects of blended learning and project-based learning on pre-service biology teachers' creative thinking skills through online learning in the COVID-19 pandemic. *Jurnal Pendidikan IPA Indonesia*, 9(3), 408–420. <https://doi.org/10.15294/jpii.v9i3.24706>