



A Study of Online Learning Studies in Natural Sciences Subject in Biology Topic during the Covid-19 Pandemic

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Abstract: Online learning is one of the efforts made by the government in the education sector to prevent the spread of Covid-19 in Indonesia. The purpose of this study is to determine the implementation of the application of online learning to science lessons in biology material during the Covid-19 pandemic. This research method is descriptive. The results showed that the implementation of online learning of Biology Science material class VIII MTs in Gorontalo City in the teacher aspect included strong criteria as seen from 5 indicators, namely online learning tools, online learning processes, student participation in online learning, online practicum implementation and the assessment process. The implementation of online learning on the material of Biology Science class VIII MTs in Gorontalo City on student aspects includes strong criteria as can be seen from 4 indicators, namely the online learning process, student participation in online learning, implementation of online practicum and increasing creativity. Thus, it can be concluded that the implementation of online learning of biology science material class VIII MTs in Gorontalo City is a strong criterion.

Keywords: Online learning; Biology science; Covid-19

Introduction

The affirmation of social restrictions between teachers/teachers and students has made many educational institutions in Indonesia choose to carry out online learning which is carried out in their respective homes. Online learning requires the support of mobile devices such as devices, laptops and the use of internet networks. Online learning requires students and teachers to be able to master the use of technology quickly, so as to improve the ability of students and teachers in the field of technology. The use of technology as a learning tool can help maximize the application of the industrial revolution 4.0 in Indonesia, where the fourth industrial revolution is largely driven by digital innovation. Currently, there are various media that help online learning such as *google classroom*, *edmodo*, *zoom meetings*, *google meet* and many more.

According to online learning, it is learning that is carried out *online* using learning applications and social media. Online learning is a strategy of implementing learning to reach a massive and broad target group

(Bilfaqih & Qomarudin, 2015). Online learning is a form of distance learning or training using technology, telecommunications and information (Arizona et al., 2020). Based on the definition of online learning that has been described, it can be concluded that online learning is a learning process that is carried out remotely between teachers and students and can reach more information by utilizing technology and the internet as learning media that can be used anywhere and anytime.

Online learning is carried out for all subjects including science. Science learning is learning that makes students gain direct experience so that they are able to increase the strength of students to accept, store and apply concepts (Iswatun et al., 2017). Djojosoediro said that one of the characteristics of science learning is that it requires various tools to help observations and involve scientific meeting activities, compiling hypotheses, visiting an object and so on. The theory learned can be applied through practicum carried out by students, but when learning is transferred online, students cannot do practicum due to limited tools and materials (Absari, 2020).

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Based on preliminary observations made, it is known that MTs Negeri 1 Gorontalo City, MTs Al-Huda and MTs Terpadu Al-Ishlah are schools in Gorontalo City that have implemented an online learning process during the Covid-19 pandemic. The implementation of online biology science subjects at MTs Negeri 1 Gorontalo was given only one hour of lessons or 40 minutes. While the online science class hours at MTs Al-Huda are given three hours of lessons or 120 minutes, but not every meeting is conducted face-to-face via online due to the limited facilities owned by students. Therefore, the teacher makes a learning video that contains an explanation of the biological material to be delivered. The subject of Biology Science online at MTs Terpadu Al Ishlah was conducted once a meeting in two weeks. In one meeting the time given is two hours of lessons or 80 minutes. Every six weeks, one face-to-face meeting is held online and two meetings are shared with learning videos.

Limited facilities owned by students can hinder the online learning process. Students who do not have a device/technology device to access science learning online will use their parents' devices so that teachers must adjust the learning time to students. During online learning, through *video conferencing*, there were students who did not activate the camera feature even though they had been given instructions by the teacher.

This study was conducted to find out how to implement the application of online learning of biology material during the covid-19 pandemic. So that this research can help schools, teachers and students in developing hybrid learning in schools. Based on the existing problems, the author is interested in conducting research on "A Study of Online Learning Studies in Natural Sciences Subject in Biology Topic during the Covid-19 Pandemic".

Method

This research is descriptive qualitative. This research was carried out in November 2021. The samples in this study were science teachers totaling 13 people and class VIII students totaling 105. The research was conducted in three schools, namely MTs Negeri 1 Kota Gorontalo, MTs Al Huda Gorontalo and MTs Terpadu Al Ishlah Gorontalo. Sample selection is determined using *purposive sampling* techniques. The data collection technique used is in the form of providing questionnaires to science teachers and class VIII students. The research procedure divided into 3 stages namely the pre-field stage, fieldwork stage, and data analysis stage.

On pre-field stage, author made initial observations to obtain quantity data information students and teachers. Make questionnaire application online learning for student and teachers then conducted

validation on two lecturers. Prepare equipments support research.

On fieldwork stage, author conducted a validity and reliability test of the research instrument to determine whether the instrument was suitable for use or not. After getting valid statement items, author distributed teacher and student questionnaires through google forms.

Then conduct data analysis using the Miles and Huberman models which are divided into 4 stages, namely *data collection*, *data reduction*, *data display*, and *data conclusion*. The data reduction using Formula 1.

$$P = \frac{F}{N} \times 100\% \tag{1}$$

Description

P = Percentage

F = Total Score of Respondent

N = Ideal Score

The interpretation of the research to be studied is about the results of the teacher and student questionnaires on each indicator so that the assessment can be seen in Table 1.

Table 1. Interpretation Cirteria for Teacher and Student Questionnaire Results

| Class Interval (%) | Percentage |
|--------------------|-------------|
| 0 - 20 | Very Weak |
| 21 - 40 | Weak |
| 41 - 60 | Enough |
| 61 - 80 | Strong |
| 81 - 100 | Very Strong |

Result and Discussion

Result

The results of research on the implementation of online learning aspects of MTs science teachers in Gorontalo City can be seen in Table 2.

Table 2. Results of the Questionnaire on the Implementation of Online Learning of Biology Science Material for Teacher Aspects

| Indicators | % | Criterion |
|---------------------------------|-------|-------------|
| Online Learning Tools | 92.00 | Very Strong |
| Online Learning Process | 73.00 | Strong |
| Student Participation | 54.00 | Enough |
| Online Practicum Implementation | 61.00 | Strong |
| Assessment Process | 74.00 | Strong |
| Average | 70.80 | Strong |

The results of research on the implementation of online learning aspects of Class VIII MTs students in Gorontalo City can be seen in Table 3.

Table 3. Results of the Questionnaire on the Implementation of Online Learning of Biology Science Material for Teacher Aspects

| Indicators | % | Criterion |
|---------------------------------|-------|-----------|
| Online Learning Process | 73.00 | Strong |
| Student Participation | 54.00 | Enough |
| Online Practicum Implementation | 61.00 | Strong |
| Improving Creativities | 74.00 | Strong |
| Average | 73.25 | Strong |

Discussion

Implementation of The Application of Online Learning in Teacher Aspects

The application of online learning in the aspect of teachers is seen based on online learning tools, online learning processes, student participation in online learning, practicum during online learning and the assessment process.

1. Online Learning Tools

Online learning tools in the teacher aspect obtained very strong results with a percentage of 92%. This is based on the importance of learning tools used by teachers online which include a Learning Implementation Plan and the use of technology.

The Online Learning Implementation Plan is one of the most important learning tools so that the learning process runs effectively. The Learning Implementation Plan lists the learning objectives that must be achieved by the teacher at each meeting. The findings in the field show that Class VIII science teachers agree that online lesson plans are very important for the learning process. This is supported by Bararah (2017) who explained that professional teachers must be able to plan learning in accordance with their duties and responsibilities as educators. Learning planning is a very important step before the implementation of learning. Planning is necessary for learning to run effectively. Learning planning is poured into the Learning Implementation Plan.

Siagian (2020) in the study explained that the preparation of Online Learning Implementation Plan is simpler. Teachers are given freedom in the learning process to choose, create, use and develop the Learning Implementation Plan format because teachers know the needs of students and the special needs needed by students in their area. Because the character and needs of students in each region can be different. The writing of Learning Implementation Plan is made concise in one page to be more efficient and effective so that teachers are not burdened by administrative problems. It is hoped that through the freedom to prepare for lesson plans, students will be more active in interacting, dynamic with a learning model that is not rigid.

In online learning, technology plays an important role in order to help implement learning

properly. Teachers' awareness of the importance of technology has a considerable influence on the successful implementation of online learning. If the teacher has difficulty in carrying out learning applications, then the biology material will not be conveyed properly to the students. Not only teachers, students are also required to be able to master the use of technology in order to operate learning applications easily. Using gadgets wisely can also help students in accessing learning resources. In this case, the learning resources used by students during learning will be very diverse and sufficient where students can easily access them through the internet. Students can obtain learning resources not only through printed books or handbooks but also through online sources that can be accessed through devices. Yudiawan et al., (2021) in their research said one of the success factors for online learning is the quality of learning resources and information.

This opinion was supported by Tekege (2017) who explained that professionalism competence is the ability of teachers to master and utilize various resources to support learning, including the ability to master science and information technology and communication in accordance with the times. Teachers play a very important role in the implementation of the teaching and learning process, therefore knowledge, skills and mastery of information and communication technology to support the learning process become something useful for teachers. Yaumi (2018) in Habibah et al., (2020) added that the development of increasingly advanced technology will affect the progress of learning media used now in different ways. Technology and information are solutions, learning media has advanced and developed along with the birth of the communication revolution that is used for learning purposes in addition to pre-existing media such as teachers, textbooks, and whiteboards.

The implementation of effective online learning cannot be separated from the role an educator. The implementation of online learning during the covid-19 pandemic is a concern for policy managers regarding the importance of using modern technology in realizing the curriculum and learning objectives. Online learning has a fundamental role in the implementation of educational goals during the covid-19 pandemic (Prisuna & Budiyo, 2022).

Hanum (2013) said that online learning is learning that utilizes internet technology to improve the learning environment with rich information and a wide scope. The use of learning media using the internet provides a series of solutions that can improve knowledge and skills. Information and communication technology-based learning will be effective if the role of the teacher as a facilitator makes it easier for students to learn, not just information providers.

2. *Online Learning Process*

The online learning process obtained strong results with a percentage of 73%. The online learning process will run well if it is in accordance with the steps of the activity and the learning objectives listed in the Learning Implementation Plan can be achieved at every meeting. Learning planning is a very important step before the implementation of learning that is poured into the lesson plan. Online learning in class VIII MTs in Gorontalo City is in accordance with the learning plan and learning objectives so that the online learning process has gone well.

The function of technology in the online learning process is not only to facilitate communication between teachers and students during the Covid-19 pandemic, the use of technology can also make it easier for teachers to deliver biology material online. Through online learning, teachers can easily display images and videos related to high-quality biology material. Even so, the ease and comfort of teachers in delivering material online can be influenced by the conditions of the surrounding environment and from within the teacher himself. The results showed that the average science teacher did not agree that the delivery of biology material online was more convenient and easier.

Interactions that occur between teachers and students during online learning such as questions and answers must always take place so that there are no misunderstandings in the delivery of the material. The results showed that teachers are aware of the need for interaction between students and teachers. The emergence of questions is caused by students' curiosity so that the online learning process does not only go one way.

When the delivery of biology material at one meeting does not achieve all learning objectives due to limited learning time, teachers must think of alternatives so that the material that is not delivered is still accepted by students. Therefore, the teacher chooses to make a learning video that contains the delivery of these materials so that students can learn the material. The results showed that teachers believed that the delivery of biology material through learning videos could be well received by students.

Assignments can make students better understand the biology material in depth, where the task contains the biology material taught to test students' understanding of the material. Assignments also allow students to explore knowledge about understanding their biological material. That's why even though learning is transferred online, assignments must still be given by the teacher, especially considering that the online lesson time is insufficient to explain one material. Findings in the field suggest that the average teacher agrees that assignments can be helpful in understanding biological material. Patliana & Purwati

(2020) said that during online learning students can easily do assignments given by teachers by accessing them via the internet and finding relevant learning resources.

3. *Student Participation in Online Learning*

Student participation greatly affects the face-to-face learning process or the online learning process. Student participation during online learning is seen from the activeness of students in participating in online learning, students pay attention to the teacher's explanations related to biology materials, always activate the camera feature until the online learning ends, student activity in asking questions and students enter assignments on time. The results showed that during the online learning process, the authors saw that teachers' answers regarding all students participating in online biology learning varied greatly where most teachers chose to hesitate. In line with the results of the research, not all students access biology learning online.

When learning online so that the teacher knows whether the student really follows the learning process to completion, the student must activate the camera feature. When there are students who do not activate the camera feature, it will be a barrier for the teacher to know what activities the student is doing during online learning or the student actually listens well to the explanation of the biology material. The results showed that teachers gave various answers to statements of students who did not activate the camera, including agreeing and disagreeing, this is in accordance with the research conducted on students.

Other students' participation in online learning is seen from the attention of students and also the activeness of students in asking questions. When students pay close attention to the teacher's explanation, then if there is a part of the material that is not understood, then the student will ask the teacher about it either during the online learning process or after the online learning process. Findings in the field show that the average teacher agrees that there are students who do not pay close attention to the teacher's explanation. This can be because there are some students who do not activate the camera feature so that the teacher does not know what activities the student is doing. When students activate the camera feature, they cannot guarantee whether the student can focus on paying attention to the teacher's explanation. Then the authors found that the average teacher disagrees regarding online learning to make students more active in asking questions. This is in accordance with the findings of the authors in the results of the student questionnaire.

One of the responsibilities of students in the learning process is to do the tasks given by the subject teacher with one's own ability in the sense that the student does

not cheat and then collect the task according to the deadline given by the teacher. Students of class VIII MTs in Gorontalo City submit assignments to the teacher on time. Sudjana (2016) in Prasetyo & Abduh (2021) said that the activeness of student learning during the online learning process is seen from several indicators, including students participating in carrying out assignments and students is able to assess themselves for the results they have obtained such as carrying out assignments with the discussion material that has been explained earlier. Then added an opinion from Pratiwi, Pribowo & Setiawan (2021) who said that students tend to procrastinate on assignments because of the large number of tasks that must be done.

4. Implementation of Online Practicum

Indicators of online practicum implementation in the teacher aspect achieved strong results with a percentage of 61.00%. During the Covid-19 pandemic, teachers gave directions to students to carry out biology material practicum online, but teachers felt that the implementation of online practicum was not going well. This is due to the absence of direct monitoring by teachers. Teachers of science subjects should be able to provide direction through parents but interaction between teachers and parents is also still lacking. Some parents interviewed admitted that students had never done a practicum of biological materials at home.

Not all practicums of biological materials must be carried out in the laboratory. As for the biological material that can do practicum for class VIII outside the laboratory, one of which is the Respiratory System material.

5. Assessment Process

The assessment process of class VIII MTs students in Gorontalo City for science subjects in biology can be categorized as high with a percentage of 74.00%. During online learning, the assessment process is carried out properly. Teachers assess students based on student test scores, student activity during online learning such as discussions and questions and answers, and biology assignments that students do.

Afrilia (2021) in the study explained that the implementation of the assessment carried out by teachers during the Covid-19 pandemic was to analyze a series of tasks that showed the progress of the students and the tasks were valued as the result of the work of the learning process. The presence of students in participating in online learning is also a determinant for teachers in the online learning assessment process.

Implementation of The Application of Online Learning Student Aspects

The application of online learning in the aspect of teachers is seen based on online learning tools, online

learning processes, student participation in online learning, practicum during online learning and the assessment process.

1. Online Learning Process

Technology makes human work easier. With technology man can find the latest information on all things including in the biological sciences. Technology with the help of the internet as a learning medium can help students to understand biological materials because there are no restrictions in accessing information. Learning is a process of interaction between teachers and students. The learning process can be said to be good if students understand the biology material presented by the teacher. Not only do they understand the explanation of biology material by the teacher face-to-face, but students must also understand the biology material explained by the teacher online. Findings in the field show that the average student of class VIII MTs in Gorontalo City can understand the explanation of biological material explained by teachers through online meetings.

This is supported by Ratih & Yanuartuti (2021) the determination of the right learning media that can be accessed easily greatly supports student creativity. Beetlestone (2011) in Widiastuti et al. (2018) explains that creativity can help a person in explaining and describing abstract concepts by involving skills. The skills in question can include curiosity, a sense of enthusiasm, discovery ability, and exploration. These skills are expected to be able to understand abstract concepts and adapt to students' ability to understand abstract things learned.

At the beginning of the application of online learning, it was found that sometimes biology lesson hours were not carried out according to the schedule. What affects is the state of schools that are still adapting to the initial conditions of the Covid-19 pandemic. Although currently the online learning process has been carried out as scheduled, the learning time is limited so that the delivery of biology material in one meeting sometimes does not reach the learning objectives or the existence of delayed meetings makes teachers have to think about learning strategies so that biology materials can still be delivered to students. Therefore, teachers choose to make learning videos containing materials so that students can learn the material even outside of biology class hours. The findings in the field show that students can receive well the explanation of the biological material presented through learning videos.

This finding is supported by Lok & Hamzah, (2021) who say that students are easier to understand abstract concepts through animation. Students feel happy when they get an in-depth explanation of abstract concepts using 3D animation and videos.

Anshor (2015) in Utami et al. (2020) revealed that video media is a medium that can help students be more active in participating in learning. Video media can attract students' attention, this is because when using these media students will involve some of their senses. Another advantage of using video in learning is that learners not only listen to what the teacher explains, but also see what facts are shown by the teacher in the video.

A good understanding of the material by students cannot be separated from the learning motivation provided by the teacher during the online learning process. Therefore, providing learning motivation is very important for students, especially during the Covid-19 pandemic. The motivation given by teachers and parents can be in the form of giving praise to students to be excited about learning even though they are online, reminding about maintaining health conditions or giving other appreciation. Student learning motivation will greatly affect students' interest in following learning. During the transfer of learning online, many students complained that they felt bored following the learning. Therefore, providing regular learning motivation to students is very important to foster student enthusiasm for learning.

This is supported by Abidin (2016) in Assidiqi & Sumarni (2020) who said that the learning process is a process of achieving learning objectives carried out by students through a series of activities under the direction, guidance and motivation of teachers. In line with what Rustan (1995) said in Supriadi (2017) that the main task of a teacher is to cultivate traits, interests and arouse students' enthusiasm for learning by providing a good and sustainable example. Hanum (2013) added that the readiness of implementing online learning can be seen from three dimensions, namely motivation to use online learning, sufficient competencies or abilities to manage and participate in online learning and resourced which includes adequate facilities, access, and technology.

The provision of learning motivation is not only given by the teacher. During the Covid-19 pandemic, students spend more time studying at home so that parents have a big role in supporting students' interest in learning. The role of parents not only provides motivation but also guides students during online learning and accompanies children when using technology. According to the results of research by Habibah et al., (2020) students really need education from parents. Parents have an important role to guide children so that they can participate in learning that is carried out online properly. Islami (2021) also said that one form of parents' role during online learning is to accompany children during online learning.

Astuti et al., (2022) in their research said that students' learning motivation during the implementation

of online learning is not only influenced by teachers, but also parents. There needs to be cooperation between teachers and parents so that students are motivated to study at home.

2. *Student Participation in Online Learning*

Student participation during online learning affects students' knowledge of biology material. Student participation during online learning such as student attendance, student activity and feedback between students and teachers will affect the absorption of biological material by students. The results showed that not all class VIII MTs students in Gorontalo City participated in online learning of biology lessons. When participating in online learning, especially when conducting video conferences, one of the important things that students must do is to activate the camera feature so that the teacher can know whether students are really following the learning process or not. Based on the results of the study, it is known that almost all students activate the camera feature while online learning is taking place. This can help teachers to know if students are serious about participating in online learning. However, there are still students who do not have the camera feature turned on. Research conducted by Pratiwi et al. (2021) shows that students often turn off camera and audio features, this is due to the saturation felt by students.

When face-to-face learning, it can be said that not all students actively ask if there is material that is not understood in the learning process, or answer questions from friends. The results of the study explained that online learning also does not make all students active in asking questions. Students disagree more about the condition, but there are still some students who agree. This relates to the next item of statement, where students tend to ask about biology material that is not understood after the biology lesson is over. Although students do not ask questions during online learning, students will contact the teacher and ask about material that is not understood outside of biology class hours or after the schedule of biology subjects. In line with Sudjana (2016) in Prasetyo & Abduh (2021) student learning activity will certainly be easily achieved if learning is carried out face-to-face. Student learning activity is an activity that involves students directly during the learning process. Student learning activity during the online learning process must certainly include several indicators, including; students actively ask questions if they are not understood either asking the teacher or friends, participating in discussions, participating in solving a problem discussed in a certain matter, and participating in finding information to solve the problem being discussed.

Student participation during online learning is also seen based on the income of assignments by students.

The timing of assignment entry also needs to be considered to discipline students, online learning cannot be used as an excuse not to enter assignments on time. Judging from the highest research results, students answered in agreement and there were still some students who disagreed regarding the timely use of assignments. In line with what was revealed by Sudjana (2016) in Prasetyo & Abduh (2021) that the activeness of student learning during the online learning process is seen from several indicators, including students participating in carrying out tasks and students is able to assess themselves for the results they have obtained such as carrying out assignments with the discussion material that has been explained earlier. Then added an opinion from Pratiwi et al. (2021) who said that students tend to procrastinate on assignments because of the large number of tasks that must be done.

3. *Implementation of Online Practicum*

Biology is a natural science that uses practicum so that students not only learn theoretically but also prove or apply accepted theories. The findings in the field obtained strong results with a percentage of 70% which means that class VIII MTs students in Gorontalo City received directions from teachers to carry out biology practicum online and carry out practicum at home properly.

As long as the learning is transferred online, the implementation of the practicum will also be carried out at home. One of the biology practicums in class VIII is found in the matter of growth and development and the respiratory system. The implementation of the online practicum from home must be carried out properly so that students do not have obstacles to carrying out the practicum. The application of practicum after theoretical explanations can strengthen students' understanding of biological material. The results of research on online practicum helping students in understanding biology material show that most students agree that the implementation of online practicum can help students understand biology material.

The fun learning process will make students excited in following the next learning. The provision of practicum is one way to get students excited where they will learn with different methods, proving the theory they learned from the teacher. The results showed that the average student giving an affirmative answer about the practicum made students excited in taking science lessons online.

4. *Increase Creativity*

Online learning is learning that requires internet access. The ease of students in accessing the internet and learning applications can help increase student creativity even in the midst of the Covid-19 pandemic. This creativity can be in the form of students' knowledge

and skills in the field of technology as well as student independence in learning biology. Giving assignments such as making short explanatory videos about biology materials can sharpen students' minds to continue thinking creatively. Through online learning, students know better that the function of gadgets is not only for communication but can also be used as a learning tool so that they can attract students' interest in learning and deepen knowledge about technology. Through online learning, students can find out the importance of technology to the development of science, especially in the field of biology.

Students' independence in doing assignments can help increase student creativity. Many students of class VIII MTs in Gorontalo City do assignments independently. Students can easily do assignments because the range of learning resources depends not only on the school package book but also through the internet.

Setiawan et al. (2021) said online learning can educate students to be more independent and responsible in doing assignments. Syauqi, Sudji & Mochamad (2020) said that students agreed about the ease of accessing online resources. This indicated that do not have difficulties in accessing online learning and do not have obstacles in online learning because they are easy to access through devices and easy to use.

Nurseto (2012) in his research revealed that the existence of technology can equalize perceptions between teachers and students. Concretizing abstract concepts, presenting dangerous or difficult objects in the surrounding environment, displaying objects too large or even too small, and can show movements that are too fast or too slow. Afghani, (2021) revealed that online learning provides mapping (maps/images) to students' mindsets so that it will have a creative effect on student thinking. Creative thinking is necessary for students who are growing in their teens. Creative education will shape a person's creativity and talents formed through learning media. Students' understanding of the use of technology in online learning is a success of online learning. Mastery of understanding the technology that will be used for online learning is what students must do before online learning. Ambiyar et al. (2020) said that online learning utilizes an internet network that allows for accessibility, connectivity and flexibility to bring up various interactions in the learning process. In line with Rozi & Lana (2021) who said that the change in the previous education system from face-to-face learning to online learning requires students to learn independently. Students can be said to be independent in the learning process when they are able to control themselves as well as the degree of self-dependence on others during the learning process. The existence of a good level of learning independence in students allows students to measure the learning achievement they want

to aim for. Learning independence can be seen from the habits of students in planning learning activities.

Conclusion

Based on the data analysis carried out, it can be concluded that the implementation of online learning of biological science materials during the Covid-19 pandemic, teacher aspects and student aspects include strong criteria with percentages of 69.50% and 74.50%, respectively.

References

- Absari, S. A. N. (2020). *Pembelajaran Daring Pada Mata Pelajaran Ipa Terpadu Di Sekolah Berbasis Pesantren (Studi Kasus Di Smp Ya Bakii 1 Kesugihan Cilacap Tahun Pelajaran 2020/2021)*. Skripsi. IAIN Salatiga. Retrieved from <http://e-repository.perpus.iainsalatiga.ac.id/9935/>
- Afghani, D. R. (2021). Kreativitas Pembelajaran Daring Untuk Pelajar Sekolah Menengah Dalam Pandemi Covid-19. *Journal of Informatics and Vocational Education*, 3(2). <https://doi.org/10.20961/joive.v3i3.43057>
- Afrilia, D. (2021). Strategi Guru Dalam melaksanakan Pembelajaran Pada Masa Pandemi Covid-19 Di kelas tinggi sekolah dasar. *Prosiding Seminar Nasional*, 1(1). Retrieved from <https://jurnal.uhnp.ac.id/psn-uhnp/article/view/126>
- Ambiyar, A., Aziz, I., & Melisa, M. (2020). Perbedaan Kemandirian Belajar Siswa Pada Masa Pandemi di SMAN 1 Lembah Melintang dan SMAN 1 Lembah Gumanti. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, 4(2), 1246-1258. <https://doi.org/10.31004/cendekia.v4i2.367>
- 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>
- Assidiqi, M. H., & Sumarni, W. (2020). Pemanfaatan Platform Digital di Masa Pandemi Covid-19. *Prosiding Seminar Nasional Pascasarjana*, 298-303. Retrieved from <https://proceeding.unnes.ac.id/index.php/snpsca/article/download/601/519>
- Astuti, S., Rukmana, D., Pramudiani, P., & Zulherman. (2022). The role of teachers and parents to improve children's motivational learning in pandemic situation. *International Journal of Evaluation and Research in Education*, 11(3), 1162-1170. <https://doi.org/10.11591/ijere.v11i3.22583>
- Bararah, I. (2017). Efektifitas Perencanaan Pembelajaran dalam Pembelajaran Pendidikan Agama Islam di Sekolah. *Jurnal MUDARRISUNA*, 7(1), 131-147. <http://dx.doi.org/10.22373/jm.v7i1.1913>
- Bilfaqih, Y., & Qomarudin, M. N. (2015). *Esensi Penyusunan Materi Daring. January 2015*, 132.
- Habibah, R., Salsabila, U. H., Lestari, W. M., Andaresta, O., & Yulianingsih, D. (2020). Pemanfaatan Teknologi Media Pembelajaran di Masa Pandemi Covid-19. *Trapsila: Jurnal Pendidikan Dasar*, 2(02), 1. <https://doi.org/10.30742/tpd.v2i2.1070>
- Hanum, N. S. (2013). Keefetifan e-learning sebagai media pembelajaran (studi evaluasi model pembelajaran e-learning SMK Telkom Sandhy Putra Purwokerto). *Jurnal Pendidikan Vokasi*, 3(1), 90-102. <https://doi.org/10.21831/jpv.v3i1.1584>
- Islami, A.O. (2021). *Peran Orang Tua dalam Pembelajaran Daring Kelas III MI Mi'rojul Ulum Jotangan Kecamatan Mojosari Kabupaten Mojokerto*. Skripsi. UIN Sunan Ampel Surabaya.
- Iswatun, I., Mosik, M., & Subali, B. (2017). Penerapan model pembelajaran inkuiri terbimbing untuk meningkatkan KPS dan hasil belajar siswa SMP kelas VIII. *Jurnal Inovasi Pendidikan IPA*, 3(2), 150. <https://doi.org/10.21831/jipi.v3i2.14871>
- Lok, W. F., & Hamzah, M. (2021). Student experience of using mobile devices for learning chemistry. *International Journal of Evaluation and Research in Education*, 10(3), 893-900. <https://doi.org/10.11591/ijere.v10i3.21420>
- Nurseto, T. (2012). Membuat Media Pembelajaran yang Menarik. *Jurnal Ekonomi Dan Pendidikan*. <https://doi.org/10.21831/jep.v8i1.706>
- Patliana., & T. Purwati. (2020). Pengaruh Pemberian Tugas Rumah Secara Daring di Masa Pandemi Covid-19 terhadap Hasil Belajar IPS Siswa Kelas VII di SMP IT Darul Ikhsan NW Balik Batang Tahun Ajaran 2019-2020. *Prosiding Seminar Nasional IKIP Budi Utomo*, 450-455.
- Prasetyo, A. D., & Abduh, M. (2021). Peningkatan Keaktifan Belajar Siswa Melalui Model Discovery Learning Di Sekolah Dasar. *Jurnal Basicedu*. 5(4). <https://doi.org/10.31004/basicedu.v5i4.991>
- Pratiwi, D., Pribowo, F. S. P., & Setiawan, F. (2021). Analisis Sikap Tanggung Jawab dalam Pelaksanaan Program Merdeka Belajar di Masa Pandemi COVID-19 Pada Siswa SD Informasi Artikel. *Jurnal Gentala Pendidikan Dasar*. 6(1). <https://doi.org/10.22437/gentala.v6i1.12028>
- Prisuna, B. F., & Budiyono, B. (2022). Persepsi mahasiswa pendidikan profesi guru dalam jabatan terhadap efektivitas pembelajaran daring menggunakan LMS Space. *Jurnal Pembangunan Pendidikan: Fondasi Dan Aplikasi*, 9(2), 90-99. <https://doi.org/10.21831/jppfa.v9i2.47887>
- Ratih, E. K., & Yanuartuti, S. (2021). Meningkatkan Daya Kreatif Siswa Menggunakan Teknologi Digital Sebagai Media Pembelajaran Daring.

- NATURALISTIC : Jurnal Kajian Penelitian Pendidikan Dan Pembelajaran*, 6(1), 942-955.
<https://doi.org/10.35568/naturalistic.v6i1.1634>
- Rozi, F., & I. Lana. (2021). Implementasi Pembelajaran Jarak Jauh (PJJ) dalam Meningkatkan Kemandirian Belajar Siswa. *Fondatia*, 5(1), 109-124.
<https://doi.org/10.36088/fondatia.v5i1.1108>
- Setiawan, E., Kastrena, E., Patah, I. A., Gani, R. A., Jumareng, H., Setiawan, E., Budiarto, B., Patah, I. A., Gani, R. A., & Kastrena, E. (2021). Analisis kelebihan dan kekurangan pembelajaran online pada kelas pendidikan jasmani selama masa pandemi Covid-19. *Jurnal Pendidikan Jasmani Indonesia*. 17(1).
<http://dx.doi.org/10.21831/jppi.v17i1.34322>
- Supriadi. (2017). Pemanfaatan Sumber Belajar dalam Proses Pembelajaran. *Lantanida Journal*, 3(2),
<https://doi.org/10.22373/lj.v3i2.1654>
- Syauqi, K., Munadi, S., & Triyono, M. B. (2020). Students' perceptions toward vocational education on online learning during the COVID-19 pandemic. *International Journal of Evaluation and Research in Education*.
<https://doi.org/10.11591/ijere.v9i4.20766>
- Tekege, M. (2017). Pemanfaatan teknologi informasi dan komunikasi dalam pembelajaran SMA YPPGI Nabire. *Jurnal Teknologi Dan Rekayasa*. 2(1). Retrieved from <https://uswim.ejournal.id/fateksa/article/view/38>
- Utami, N., Khairuddin, K., & Mahrus, M. (2020). Perbedaan Hasil Belajar Biologi Siswa pada Penggunaan Media Video dengan Media Powerpoint Melalui Pembelajaran dalam Jaringan (Daring) di SMAN 3 Mataram Tahun Ajaran 2020/2021. *Jurnal Ilmiah Profesi Pendidikan*, 5(2), 96-101. <https://doi.org/10.29303/jipp.v5i2.120>
- Widiastuti, A., Istihapsari, V., & Afriady, D. (2018). Meningkatkan Kreativitas Siswa Melalui Project Based Learning pada Siswa Kelas V SDIT LHI. *Prosiding Pendidikan Profesi Guru Fakultas Keguruan Dan Ilmu Pendidikan*.
- Yudiawan, A., Sunarso, B., Suharmoko, Sari, F., & Ahmadi. (2021). Successful online learning factors in covid-19 era: Study of islamic higher education in west papua, indonesia. *International Journal of Evaluation and Research in Education*.
<https://doi.org/10.11591/ijere.v10i1.21036>