



Students' Perspectives on Virtual Learning During the COVID-19 Pandemic

Hermansyah¹, Musahrain^{2*}, Suji Ardianti³, Syafruddin⁴

^{1,3}Physics Education Study Program, ²Educational Technology Study Program, ⁴Educational Biology Study Program, Universitas Samawa

Jl. Bypass Sering, Kerato, Kec. Unter Iwes, Kabupaten Sumbawa, Nusa Tenggara Bar. 84316, Indonesia

*Corresponding author, e-mail: musahrainbima@gmail.com

ARTICLE INFO

Article history:

Received: 03-04-2022

Revised: 27-06-2022

Accepted: 08-09-2022

Kata kunci:

Pembelajaran Online; Calon guru; COVID-19.

Keywords:

Online learning; Teachers' candidate; COVID-19.



This is an open access article under the [Creative Commons Attribution-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-sa/4.0/) license.

Copyright © 2022 by Author.
Published by Universitas Negeri Malang.

ABSTRAK

Pembelajaran virtual merupakan proses belajar mengajar yang menggunakan media virtual berbantuan platform berbasis Web. Penelitian deskriptif kuantitatif ini bertujuan untuk memperoleh gambaran pelaksanaan pembelajaran virtual online calon guru pada masa pandemic COVID-19. Penelitian ini dilakukan pada calon guru di Fakultas Keguruan dan Ilmu Pendidikan Universitas Samawa. Responden penelitian sebanyak 51 orang calon guru yang dipilih menggunakan teknik purposive sampling. Instrumen dalam penelitian ini menggunakan kuesioner berisi pertanyaan dan pernyataan yang berjumlah 13 item dengan satu kolom komentar yang disediakan diakhir. Angket tersebut menggambarkan tentang proses pembelajaran virtual online dari kesiapan infrastruktur sampai dengan prospek pembelajaran ini kedepan. Hasil penelitian diperoleh bahwa dari empat aspek yang diukur, mahasiswa calon guru memiliki pandangan positif tentang proses pembelajaran secara daring termasuk berkategori tinggi kecuali pada aspek kepraktisan. Dapat disimpulkan bahwa pembelajaran secara daring mempermudah mahasiswa dalam proses belajar dan sangat membantu mereka dalam menghindari pencemaran COVID-19.

ABSTRACT

Virtual learning is a teaching and learning process using virtual media assisted by a Web-based platform as a tool in the teaching and learning process. This quantitative descriptive study aims to obtain an overview of the implementation of virtual online learning for prospective teachers during the COVID-19 pandemic. This study was conducted on prospective teachers at the Faculty of Teacher Training and Education, Samawa University. The research respondents were 51 prospective teachers selected using the purposive sampling technique. The instrument in this study used a questionnaire containing questions and statements totaling 13 items with one comment column provided at the end. The questionnaires discuss the online virtual learning process, from infrastructure readiness to prospects for this learning. The study results showed that from the four aspects measured; teacher candidates had a view of the learning process being categorized as high except for the practical element. It can be concluded that online learning makes it easier for students in the learning process and helps them avoid contamination with COVID-19.

INTRODUCTION

During COVID-19, there has been an extensive and rapid change in the condition of human life. One of the most prominent sectors is the educational sector. It has changed the learning process from face-to-face learning to online learning, whether in elementary, junior high and senior high, or university. This is done to avoid large gatherings and crowds to block the transmission of the virus (Chen et al., 2020). Therefore, the current condition resulted in the past few months, especially in higher education, which has often used online learning besides speech-based learning that is routine in class (Bhargava, 2020).

Online learning is suitable for educators and students during the current pandemic. In addition to providing convenience in terms of the teaching and learning process, on the other hand, Information and Communication Technology (ICT) contributes to a new and innovative education for students (Tartavulea et al., 2020; Kauppi et al., 2020). Online learning can present the material in total, namely in texts, graphics, audio, and videos (Jugănar, 2020). In addition to providing material, assessment of the learning process also has its challenges for educators who require to choose effective assessment techniques during online learning. These assessments include homework, group work, involvement in discussion forums (group discussion), critical thinking, and problem-solving (Huang et al., 2020).

On the one hand, online learning is certainly not easy to realize, especially for students who depend on face-to-face learning. Some things that should be the focus of educators, take in (a) Building student awareness and motivation in learning, (b) An educator must encourage interaction and cooperation between students, (c) Forming a study group with an online environment so that students do not feel independent learning and (d) Interact and monitor their presence online as feedback in the learning process (Khotimah et al., 2020). In addition, the equalization of networks from all corners significantly affects accessing the learning content provided. Therefore, it is also necessary to consider the appropriate social network used by educators and students in carrying out online learning.

Social networks that can be used to facilitate online learning and have a good impact in terms of improving the quality of learning are found a lot, including Schoology is able to improve the critical thinking skills of students (Ardianti et al., 2020), Edmodo is able to support educators and students in terms of increasing digital literacy and being able to learn independently, Moodle is able to improve student learning outcomes (Riyanto & Nugrahanti, 2018), and WhatsApp is able to increase motivation and contribute in terms of increasing student activity (Dahdal, 2020). Of the many social networks that have been presented or not, their success in learning will be greatly influenced by the process of implementing online learning (Nuere & de Miguel, 2021). In line with this, Daulay et al (2021) stated that optimizing social media-based online learning media increases students' motivation in learning and creates a vibrant learning atmosphere with the interaction between students and students, teachers, or vice versa.

On the one hand, when applied at the student level, online learning is certainly not too passive in terms of operation (Ningsih, 2020). It is because students' use of smartphones or laptops in various parts of the world has become an essential element of their activities. In addition, by subscribing to data packages and WIFI, students will easily get high-speed internet access (Alqahtani et al., 2018). Therefore, this study was conducted to find out students' profiles and perceptions of online learning during the pandemic. The perceptions expected from students in this study are in the aspects of the infrastructure used, the practicality of using learning media, students' skills in using learning media, and their perspectives on the learning process during the pandemic using online learning media. These aspects are used because, based on our analysis, these four aspects impact students' learning outcomes when conducting online learning. This was also stated by Putra (2021), that the practicality of media and learning infrastructure could affect student learning outcomes. Furthermore, another study conducted by Hadisi & Muna (2015) that the application of online learning media had an impact on learner skills. The results of this measurement are expected to be the basis for improvements in online learning so that the quality of service and students' satisfaction is maintained during the COVID-19 pandemic.

METHOD

This research is descriptive-qualitative. This research was conducted in 5 study programs under the auspices of the Faculty of Teacher Training and Education, Samawa University. The respondents in this study were 51 people consisting of 10 men and 41 women. Research respondents have represented each study program. There are 11 prospective teachers from the Biology Education study program, 15 from the Educational Technology study program, eight from Physics education, seven from Indonesian Language and Literature Education, and ten teacher candidates from the Economic Education study program. The sampling technique used is purposive sampling, considering that the sample used amounted to half of each study program. The research instrument used is a questionnaire with a Likert scale of 1-5. The questionnaire used contains 13 statements related to the online learning process during the pandemic with several aspects such as facilities and infrastructures, practicalities, skills, and implementation aspects. At the end of the questionnaire, a comment column was given, which helped obtain information supporting the statements provided. The data analysis techniques used are data classification, data tabulation, scoring of respondents' answers, percentage of answers for each item, calculation of the average percentage of the questionnaire, data visualization, and interpretation of the percentage of questionnaire answers. Then, the data is quantified with the following equation:

$$\text{Acquired Vale: } N = \frac{\text{total score obtained}}{\text{Maximum score}} \times 100 \quad (1)$$

Interpretation of the data using criteria according to Riduwan (2011) as shown in [Table 1](#).

Table 1. Score Interpretation Criteria

Scale	Categories
81-100	Very High
61-80	High
41-60	Equal
21-40	Low
0-20	Very Low

RESULT

The results of the studies that have been carried out are presented in [Table 2](#). The data in [Table 2](#) shows that Biology Education Study Program students have a high perspective on all aspects except practical aspects. Physics Education Study Program students have a high perspective on the aspects of facilities and infrastructure and the aspects of implementation. Students of the Educational Technology Study Program have a very high perspective on the aspects of implementation, facilities and infrastructure, and skills, and are quite high in the practical aspect. Students of the Indonesian Education Study Program have a very high perspective on the aspects of facilities and infrastructure, and implementation, high in the aspect of skills, and quite high in the aspect of practicality. Students of the Economic Education Study Program have a high perspective on all aspects except the practical aspect. All aspects measured fall into the high category except for the practicality aspect, which is categorized as quite high for students of the entire study program. More details can be seen in [Table 2](#) and [Figure 1](#).

[Figure 1](#) shows that students have a high perspective on all aspects except the practical aspects of online learning during a pandemic like today. The four aspects received a reasonably good response even though there was a difference in the average value between the four. Aspects of facilities and infrastructure, students' perspectives from the five study programs on the availability and support of facilities and infrastructure in online learning are pretty good, with an average score of 76.47 percent. At the practicality aspect, student perspectives on ease or practicality in online learning obtained a score of 53.88 percent. Skill aspects based on the scores obtained from 51 respondents related to the view of prospective teacher students on online learning during the COVID-19 period, which was 67.06 percent, while in the aspect of implementing the response of prospective teacher students, it was 78.43 percent. In the

implementation aspect, the student's perspective on this aspect is the highest compared to the other three aspects. From all these aspects, the implementation aspect received the highest response (the highest students' perspective) compared to the other three aspects. Meanwhile, the practicality aspect received the lowest response among all of them.

Table 2. Students' Perspective Scores for Each Study Program

Aspect	Education study program					
	Biology	Physics	Educational Technology	Indonesian Language	Economy	
Infrastructures	69.09	70.00	80.00	85.71	78.00	
Practicality	57.09	54.50	53.07	53.14	51.60	
Skills	64.55	60.00	67.33	68.57	74.00	
Implementation		63.64	80.00	84.00	85.71	80.00

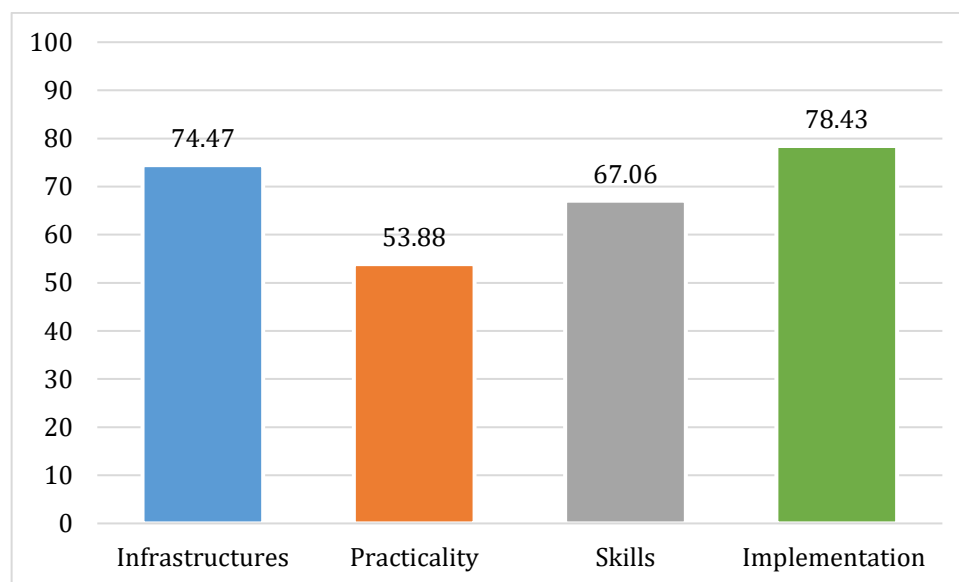


Figure 1. Students' Perspective Score Acquisition towards Online Learning

DISCUSSION

Online Learning

Educational quality is a fundamental problem in improving the education system. The development of learning-oriented learners can improve the quality of education. To make it happen, we need a learning process that allows students to have innovative abilities. One embodiment of the learning process is by utilizing internet technology in learning (Elyas, 2018). The same thing has also been revealed (Hasibuan, 2016) that using technology and other supporting infrastructure in the learning process will impact the quality of learning that increases.

The outbreak of COVID-19 in Indonesia also has an impact on the education system; learning that used to be usually carried out conventionally (face-to-face) during the pandemic and education at various levels was carried out with an online system (Syafuruddin, 2020). No exception for all universities in Indonesia to carry out the lecture process online or online (Firman & Rahayu, 2020). In common, online learning is very alter from face-to-face learning. Online learning accentuates precision and forethought in meting out and in receipt evidence presented online. According to Moore (2011), online teaching and learning activities are a learning process by utilizing internet access, connectivity, and flexibility for various interactions in these activities (Zhang et al., 2004).

Mobile devices (smartphones, tablets, and laptops/computers) have an important role in supporting the implementation of online learning (Gikas & Grant, 2013). Mobile devices play a big role in learning to achieve the desired target in distance learning (Korucu & Alkan, 2011). The use of various types of learning management system (LMS) platforms such as Google Classroom,

Edmodo, and Schoology can support the implementation of virtual teaching and learning activities while remaining interactive (Enriquez, [2014](#); Sicat, [2015](#); Iftakhar, [2016](#)) also WhatsApp as an additional application (So, [2016](#); Noviati, [2020](#)). In addition to using the LMS and WhatsApp platforms, Facebook and Instagram can also be used by teachers and students as learning tools (Kumar & Nanda, [2019](#)). Online learning allows teachers to carry out tasks and learners to construct knowledge even without having to meet in person in class through learning materials presented in the form of PowerPoints, e-books, videos, or other media that can be done independently or in groups. The assessment process is also carried out directly on the platform used.

Online learning can provide students with convenience

In general, according to students, online learning is delightful because they think it is very flexible. Online learning allows students to carry out teaching and learning activities or do assignments from their respective homes without being limited by time and place. With such learning, lecturers can explain the materials taught through a platform that can be done without being limited by space and time. Through this condition, students can choose which courses to take and which assignments to do first. Research by Sun et al ([2008](#)) informed that time constraints, no learning methods, and offline learning did not affect student learning satisfaction.

Online learning also shows that students feel more comfortable expressing ideas and questions in online learning. Azis ([2020](#)) states that (1) there are basic facilities needed by students in carrying out the learning process; (2) the flexibility of online learning is able to encourage the emergence of independence and increase student learning motivation, and (3) remote teaching and learning activities are able to encourage social distancing behavior to minimize the emergence of student crowds so that it is considered to reduce the potential for the spread of Covid-19 in the university environment. The lecturers' absence directly or physically also causes students to feel less awkward in expressing ideas. Then, online learning eliminates the awkwardness that ultimately gives students the courage to speak for themselves by asking questions and saying their thoughts freely.

Self-regulation in learning can be fostered through the use of appropriate media or platforms for online teaching and learning activities. Online applications can increase the sense of understanding (Oknisi, N., & Suyoto, [2019](#)) & (Hermansyah et al., [2020](#)). Kuo et al. ([2014](#)) stated that online learning is student-centered and able to create a sense of responsibility and autonomy in learning for learners. Online learning involves students preparing their knowledge, evaluating, organizing, and maintaining motivation in education (Sun, [2014](#); Aulia & Aina, [2016](#)). Meidawati ([2019](#)) stated that online learning could increase student interest.

Online learning has distinct challenges, the location of students and lecturers who are separated when carrying out causes lecturers to be unable to directly oversee students going on during the learning process. Furthermore, there is no guarantee that students are serious about listening to reviews from lecturers. Szpunar et al ([2013](#)) described in their study that students commit to memory more often in online learning than during face-to-face lessons. Therefore, it is recommended that online learning should be held in the not-too-distant future, considering that students find it challenging to maintain their concentration if online lectures are held for more than an hour.

The study's results also conveyed that the material given online is difficult to understand by many students. Teaching materials are usually delivered as readings that are not easily understood thoroughly by students (Sadikin & Hakim, [2019](#)). They assume that the material and tasks are insufficient because they need to be explained directly by the lecturer. Garrison & Cleveland-Innes ([2005](#)) and Swan ([2002](#)) lecturers who often enter the class can convey material well than lecturers who rarely enter.

The results showed that learning since the COVID-19 virus uses an online learning system. According to students, the online learning system is already effective. Online learning activities run well and are fun even though there are obstacles in using the Zoom application, namely the situation and conditions of the home environment or network (signal). Furthermore, it can hinder students whose internet connection is slow. Still, if there is unclear information, the lecturer will

repeat the explanation until the students understand the material provided by the lecturer. Applications used for the courses are namely Schoology, Google Classroom, and Zoom (Windhiyana, 2020).

CONCLUSION

Virtual learning during a pandemic like this is the best alternative that can be applied to overcome the spread of this outbreak. Based on the results of this study, it can be concluded that online learning makes it easier for students in the learning process and helps them avoid the pollution of the COVID-19 virus. However, this research only discusses students' perspectives in the five study programs. Furthermore, it is only limited to those measured by four aspects, namely aspects of facilities and infrastructure, practicality, skills, and implementation. For this reason, it is hoped that the next researcher will be able to see students' perspectives on online learning by involving a wider range of study programs and more comprehensive respondents.

REFERENCES

- Alqahtani, S. M., Bhaskar, C. V., Vadakalur Elumalai, K., & Abumelha, M. (2018). WhatsApp: An online platform for university-level english language education. *Arab World English Journal*, 9(4), 108-121. <https://doi.org/10.24093/awej/vol9no4.7>
- Ardianti, S., Sulisworo, D., Pramudya, Y., & Raharjo, W. (2020). The impact of the use of STEM education approach on the blended learning to improve student's critical thinking skills. *Universal Journal of Educational Research* 8(3B), 24-32. <https://doi.org/10.13189/ujer.2020.081503>
- Aulia, N. winanda, & Aina, M. (2016). Pengembangan multimedia interaktif menggunakan camtasia studio 8 pada pembelajaran biologi materi kultur jaringan untuk siswa SMA kelas XI MIA. *BIODIK*, 2(1), 20-26. <https://doi.org/10.22437/bio.v2i1.3365>
- Azis, A. T. (2020). Kemandirian belajar mahasiswa program studi PPKN STKIP PGRI Nganjuk melalui pembelajaran daring di masa pandemi COVID-19. *Jurnal Dharma Pendidikan STKIP PGRI Nganjuk*, 15(2), 83-92.
- Bhargava, S. (2020). Online classes for medical students during COVID-19 pandemic: through the eyes of the teaching faculty. *Journal of Research in Medical and Dental Science*, 8(4), 189-192.
- Chen, T., Peng, L., Jing, B., Wu, C., Yang, J., & Cong, G. (2020). The impact of the COVID-19 pandemic on user experience with online education platforms in China. *Sustainability (Switzerland)*, 12(18), 7329. <https://doi.org/10.3390/SU12187329>
- Dahdal, S. (2020). Using the WhatsApp social media application for active learning. *Journal of Educational Technology Systems*, 49(2), 239-249. <https://doi.org/10.1177/0047239520928307>
- Daulay, F., Purba, H. S. I., Tarigan, M. B., & Lubis, M. J. (2021). Efektivitas pemanfaatan platform media pembelajaran di masa pandemi Covid-19. In *Prosiding Seminar Nasional PBSI-IV Tahun 2021 Tema: Pembelajaran Bahasa dan Sastra Indonesia Berbasis Digital Guna Mendukung Implementasi Merdeka Belajar* (135-142). FBS Unimed Press. <http://digilib.unimed.ac.id/id/eprint/43391>.
- Elyas, A. H. (2018). Penggunaan model pembelajaran e-learning dalam meningkatkan kualitas pembelajaran. *Jurnal Warta*, 56(04), 1-11. <https://doi.org/10.46576/wdw.v0i56.4>
- Enriquez, M. A. S. (2014). Students' perceptions on the effectiveness of the use of Edmodo as a supplementary tool for learning. *DLSU Research Congress*, 2(6), 1-6. <https://doi.org/10.1017/CBO97-81107415324.004>
- Firman, F., & Rahayu, S. (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>
- Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: interaction is not enough. *International Journal of Phytoremediation*, 21(1), 133-148. https://doi.org/10.1207/s15389286ajde1903_2
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *Internet and Higher Education*, 19, 18-26. <https://doi.org/10.1016/j.iheduc.2013.06.002>
- Hadisi, L., & Muna, W. (2015). Pengelolaan teknologi informasi dalam menciptakan model inovasi pembelajaran (e-learning). *Jurnal Al-Ta'dib*, 8(1), 117-140. <http://dx.doi.org/10.31332/atdb.v8i1.396>
- Hasibuan, N. (2016). Pengembangan pendidikan islam dengan implikasi teknologi pendidikan. *FITRAH: Jurnal Kajian Ilmu-Ilmu Keislaman*, 1(2), 189-206. <https://doi.org/10.24952/fitrah.v1i2.313>

- Hermansyah, H., Yahya, F., Fitriyanto, S., Musahrain, M., & Nurhairunnisah, N. (2020). Kemandirian belajar calon guru fisika melalui pembelajaran berbasis LMS: Schoology. *Indonesian Journal of STEM Education*, 2(1), 34-42.
- Huang, R. H., Liu, D. J., Tlili, A., Yang, J. F., & Wang, H. H. (2020). Handbook on facilitating flexible learning during educational disruption: The Chinese experience in maintaining uninterrupted learning in COVID-19 Outbreak. *Smart Learning Institute of Beijing Normal University UNESCO*.
- Iftakhar, S. (2016). Google classroom: What works and how?. *Journal of Education and Social Sciences*, 3(1), 12-18.
- Jugănar, M. (2020). From traditional education to the online training process in Romanian higher education—an experiment generated by the new coronavirus pandemic. *Ovidius University Annals, Series Economic Sciences*, 20(1), 676-681. [RePEc:ovi:oviste:v:xx:y:2020:i:1:p:676-681](https://doi.org/10.1111/bjiet.12929)
- Kauppi, S., Muukkonen, H., Suorsa, T., & Takala, M. (2020). I still miss human contact, but this is more flexible—Paradoxes in virtual learning interaction and multidisciplinary collaboration. *British Journal of Educational Technology*, 51(4), 1101-1116. <https://doi.org/10.1111/bjiet.12929>
- Khotimah, H., Zainiyati, H. S., Hamid, A., & Basit, A. (2020). E-learning application Madrasah online learning solution in the middle of pandemic Covid-19 in Ma Negeri Insan Cendekia, Kendari. *Technium Social Sciences Journal*, 10. <https://doi.org/10.47577/tssj.v10i1.1365>
- Korucu, A. T., & Alkan, A. (2011). Differences between m-learning (mobile learning) and e-learning, basic terminology and usage of m-learning in education. *Procedia - Social and Behavioral Sciences*, 15, 1925-1930. <https://doi.org/10.1016/j.sbspro.2011.04.029>
- Kumar, V., & Nanda, P. (2019). Social media in higher education: A framework for continuous engagement. *International Journal of Information and Communication Technology Education*, 15(1), 97-108. <https://doi.org/10.4018/IJICTE.2019010108>
- Kuo, Y. C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, 20, 35-50. <https://doi.org/10.1016/j.iheduc.2013.10.001>
- Meidawati, S. A. N. B. R. (2019). Persepsi siswa dalam studi pengaruh daring learning terhadap minat belajar IPA. *SCAFFOLDING: Jurnal Pendidikan Islam Dan Multikulturalisme*, 1(2), 30-38. <https://doi.org/10.37680/scaffolding.v1i2.117>
- Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). E-Learning, online learning, and distance learning environments: Are they the same?. *The Internet and Higher Education*, 14(2), 129-135. <https://doi.org/10.1016/j.iheduc.2010.10.001>
- Ningsih, S. (2020). Persepsi mahasiswa terhadap pembelajaran daring pada masa pandemi Covid19. *JINOTEP (Jurnal Inovasi Dan Teknologi Pembelajaran): Kajian Dan Riset Dalam Teknologi Pembelajaran*, 7(2), 124-132. <http://dx.doi.org/10.17977/um031v7i22020p124>.
- Noviati, W. (2020). Kesulitan pembelajaran online mahasiswa pendidikan biologi di tengah pandemi Covid19. *JURNAL PENDIDIKAN MIPA*, 10(1), 7-11. <https://doi.org/10.37630/jpm.v10i1.258>
- Nuere, S., & de Miguel, L. (2021). The digital/technological connection with COVID-19: an unprecedented challenge in university teaching. *Technology, Knowledge and Learning*, 26(4), 931-943. <https://doi.org/10.1007/s10758-020-09454-6>
- Oknisi, N., & Suyoto, S. (2019). Penggunaan Apln (Aplikasi Online) Sebagai Upaya Kemandirian Belajar Siswa. *Seminar Nasional Pendidikan Dasar*, 1(1).
- Putra, O. L. (2021). Pengembangan media pembelajaran matematika menggunakan powerpoint dengan perpaduan mind mappada siswa kelas X MIPA SMA Negeri 7 Padang. *JANGKA Jurnal Pendidikan Matematika Ekasakti*, 1(1), 29-37. <https://doi.org/10.31933/jangka.v1i1.176>
- Riduwan. (2011). Belajar Mudah Penelitian. *Book*, 1(1).
- Riyanto, S., & Nugrahanti, F. (2018). Pemanfaatan aplikasi moodle dalam pembelajaran statistik pada mahasiswa informatika. *Multitek Indonesia*, 12(1), 40-46. <https://doi.org/10.24269/mtkind-v12i1.679>
- Sadikin, A., & Hakim, N. (2019). Pengembangan media e-learning interaktif dalam menyongsong revolusi industri 4.0 pada materi ekosistem untuk siswa SMA: Interactive media development of e-learning in welcoming 4.0 industrial revolution on ecosystem material for high school students. *Biodik*, 5(2), 131-138. <https://doi.org/10.22437/bio.v5i2.7590>
- Sicat, A. S. (2015). Enhancing college students' proficiency in business writing via schoology. *International Journal of Education and Research*, 3(1), 159-178.
- So, S. (2016). Mobile instant messaging support for teaching and learning in higher education. *Internet and Higher Education*, 31, 32-42. <https://doi.org/10.1016/j.iheduc.2016.06.001>

- Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers and Education*, 50(4), 1183-1202. <https://doi.org/10.1016/j.compedu.2006.11.007>
- Sun, S. Y. H. (2014). Learner perspectives on fully online language learning. *Distance Education*, 35(1), 18-42. <https://doi.org/10.1080/01587919.2014.891428>
- Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication & Information*, 2(1), 23-49. <https://doi.org/10.1080/1463631022000005016>
- Syafuruddin, S., Musahrain, M., Noviati, W., Safitri, A., & Suhendra, R. (2020). Peningkatan kompetensi guru melalui pelatihan dan pendampingan di bidang TIK bagi guru SD Negeri Leseng Moyo Hulu. *Jurnal Pendidikan dan Pengabdian Masyarakat*, 3(4), 228-232.
- Szpunar, K. K., Moulton, S. T., & Schacter, D. L. (2013). Preperformance state, routines, and automaticity: What does it take to realize expertise in self-paced events?. *Journal of sport and exercise psychology*, 24(4), 359-375. <https://doi.org/10.3389/fpsyg.2013.00495>
- Tartavulea, C. V., Albu, C. N., Albu, N., Dieaconescu, R. I., & Petre, S. (2020). Online teaching practices and the effectiveness of the educational process in the wake of the Covid-19 pandemic. *Amfiteatru Economic*, 22(55), 920-936. <https://doi.org/10.24818/EA/2020/55/920>
- Windhiyana, E. (2020). Dampak Covid-19 terhadap kegiatan pembelajaran online di sebuah perguruan tinggi kristen di Indonesia. *Perspektif Ilmu Pendidikan*, 34(1), 1-8. <https://doi.org/10.21009/PIP-341.1>
- Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker, J. F. (2004). Can e-learning replace classroom learning?. *Communications of the ACM*, 47(5), 75-79. <https://doi.org/10.1145/986213.986216>