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Analysis of E-Learning Platform Variation in Biology Learning at Grade 11 of High Schools in Semarang City

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ABSTRACT

The emergence of Coronavirus-19 disease has caused all educational institutions to switch the face-to-face learning mode to distance learning with an online system. Online learning requires teachers and students to use a tool to help teaching and learning activities, namely the e-learning platform. The purpose of this study is to analyze the various e-learning platforms used by biology teachers in grade 11 of public senior high schools (SMA) and Islamic public high schools (MA) in Semarang City. This research is a qualitative descriptive study using the analysis of the Miles and Huberman model. The purposive sampling technique was used by considering the geographical location of the school and the diversity of platforms used. The samples were 5 schools: 3 high schools (SMA) and 2 Islamic Public high School of Madrasah Aliyah. Data collection techniques used semi-structured interviews and documentation studies. The results show that the e-learning platforms used by biology teachers are very diverse, ranging from instant messaging platforms such as WhatsApp, video conferencing platforms such as Google Meet and Microsoft Team, and Learning Management System (LMS) platforms such as Moodle, Google Classroom, Microsoft Office 365, and Madrasah e-learning. Each school uses a different type of platform and is adapted to school policies and student needs. Some schools develop their own e-learning platforms for online learning so that their use is mandatory, but this does not limit teachers from integrating other platforms so that learning objectives can be achieved perfectly.

Keywords: Biological learning, E-learning platform, Online learning

Introduction

The Coronavirus Disease (Covid-19) has been declared by the WHO (World Health Organization) emergency committee since January 30, 2020, to be a global health emergency (Velavan & Meyer, 2020). This epidemic caused various impacts on several important sectors in every country in the world. According to Batubara (2021), the Indonesian government has declared a disaster emergency since early March 2020 when the first case of Covid-19 appeared in Indonesia, and based on data from the WHO, Indonesia has a relatively high level of virus transmission, especially in Asia.

Education is one of the sectors that has been most affected by the COVID-19 pandemic. To overcome this, the Government through the Minister of Education and Culture issued a Circular Letter of the Minister of Education and Culture Number 3 of 2020 signed by the Minister of Education, Nadiem Makarim, regarding the policy of the learning process being shifted to online learning to reduce the increase in the number of patients with Covid-19 (Ministry of Education and Culture, 2020).

The facts show that online learning has not been implemented properly and effectively. This is because the transition from face-to-face learning to online learning takes place suddenly without any prior preparation. It is proven by initial observations in one of the senior high schools in Semarang City which shows that online learning seems sudden and lacks preparation both in terms of infrastructure, systems/applications, content, and operators so that learning is less effective. Likewise, in terms of implementing learning, both teachers and students do not understand the online learning system well because learning with this system is a new thing in primary and secondary education.

Online learning is not the first to be implemented in the world of education, but many institutions have implemented this learning model, such as universities or course institutions. Online learning usually uses various types of supporting tools or e-learning platforms that are commonly used in the learning process. Nafi'ah (2021) states that e-learning has actually been used in 1960, when the first Computer Based Training (CBT program) or commonly known as PLATO (Programmed Logic for Automated Teaching Operations) was discovered. E-learning in Indonesia has begun to be used in the 90s with the development of information technology. This is the background of many organizations, institutions, and institutions that have re-started the development of e-learning after the monetary crisis in 2000 subsided.

Learning with e-learning has been widely applied, especially in biology subjects, many schools use various learning methods and e-learning platforms to support the biology learning process. According to Kurniati et al. (2021) the learning process is an interaction or reciprocal relationship between teachers and students. Teachers have an important role in the learning process so that teachers are required to create a creative and innovative learning atmosphere in the classroom. Especially in a pandemic, teachers must use the right method in delivering the material, as well as the right platform so that learning objectives can be achieved.

Gunawan, Suranti, and Fathoroni (2020) revealed several platforms used by educators in conducting distance learning. The most widely used platforms are WhatsApp (94%), e-mail (55%), Google Classroom (34%), Moodle (25%), Zoom Meeting (16%), and other platforms such as Webbex, Blog, Discord or YouTube (8%). Another study by Padli and Rusli (2020) stated that the platforms most favored by students were WhatsApp or other social media (72.6%), followed by video conferencing (47.2%), Google Classroom (31.1%), school-owned applications (18.9%), and the last one is YouTube (13.2%). According to Saifuddin (2017), the implementation of learning with e-learning among students stated that

86.3% of students agreed, while another 13.7% said they did not agree. This shows the need for e-learning in learning in the digital era.

So far, research related to the analysis of e-learning platforms in high school and MA biology learning is still rare. Several previous studies are more focused on other aspects. First, Nadziroh (2017) who examines the effectiveness of e-learning-based learning systems. Second, Setiaji et al. (2020) which examined the readiness of students majoring in physics education to use e-learning in the Covid-19 pandemic situation. Third, Sayekti et al. (2021) who researched the implementation of e-learning in the distance learning system in PAI subjects at SMA IT Pesantren Nururahman, thus this research and publication is very important or relevant to do.

This study aims to analyze the various e-learning platforms used in biology learning in class XI SMA and MAN in Semarang City during the Covid-19 pandemic. This research has a contribution as a positive evaluation and reference as well as improvements in the implementation of online learning

Methods

This research is included in the type of qualitative descriptive research. The variable in this study is the use of various e-learning platforms in biology learning in SMA/MA. The study was conducted in the even semester 2020/2021. The sampling technique used was purposive sampling by considering the diversity of the e-learning platforms used and the geographical location of the school, so that SMAN 5 Semarang, SMAN 15 Semarang, SMAN 16 Semarang, MAN 1 Semarang, and MAN 2 Semarang were selected as research locations. The participants were biology teachers (N=5) as representee of each school. Data collection techniques used are semi-structured interviews and documentation studies. The data obtained were then analyzed using the Miles and Hubermen model which has the following steps: data reduction, data presentation, and drawing conclusions.

Result and Discussion

Distance Learning during the Covid-19 pandemic has forced teachers to look for alternative e-learning platforms that can support the implementation of learning. From the results of field research in three State Senior High Schools and two State Islamic Senior High Schools located in Semarang City, it can be seen that teachers use very diverse platforms in carrying out online biology learning. Teachers do not only use one e-learning platform but use several platforms in the hope that one platform can complement each other. The results of the research regarding the various e-learning platforms used by teachers in learning biology in class XI can be seen in Table 1.

Table 1. Variety of E-learning Platforms in Biology Learning

No	School	*E-Learning Platform*
1	SMAN 5 Semarang	Moodle , Google Meet, WhatsApp
2	SMAN 15 Semarang	PJJ Smart Libels, Microsoft 365
3	SMAN 16 Semarang	Google Classroom, Google Meet, WhatsApp
4	MAN 1 Semarang	*E-learning* Madrasah, Quipper, Google Meet Google Form, WhatsApp
5	MAN 2 Semarang	*E-learning* Madrasah, WhatsApp

The e-learning platforms used by biology teachers are very diverse and integrated with one another. On average, teachers use 2-3 e-learning platforms to carry out online biology learning. The use of the platform is also considered with school policies, student needs, and the strengths and weaknesses of the platform. Table 2 shows the reasons and considerations of teachers in using e-learning platforms in each school.

Table 2. Details of Using the E-learning Platform at Each School

School	Reasoning	Use
SMAN 15 Semarang	Moodle: easy, practical, and accurate Google Meet: easy and save quota WhatsApp: practical and familiar	Used on all materials, while WhatsApp is only for conveying important information
SMAN 15 Semarang	PJJ Smart Libels: must be used because of school policy, practical in attendance and evaluation Ms. 365: easy for material delivery and assignments/exams	Used on all materials
SMAN 16 Semarang	Google Classroom: easy and convenient to share materials and assignments Google Meet: easy to use and save quota WhatsApp: practical and easy to use	Used on all materials
MAN 1 Semarang	Madrasa e-learning: practical for attendance Google Suite: easy, practical and economical (free access) Quipper School: easy to use and there are questions and discussions WhatsApp: easy and familiar to use	Used on all materials, while WhatsApp is for collecting assignments
MAN 2 Semarang	*E-learning* madrasah: easy for attendance, WhatsApp: practical for delivering material and assignments	Used on all materials

A. SMAN 5 Semarang

Biology learning in grade 11 is carried out using e-learning owned by a school called *Elima* (Elearning SMAN 5 Semarang) which was developed with LMS Moodle as a means of carrying out the teaching and learning process. *Elima* is the main platform used in learning. This e-learning belonging to SMA N 5 Semarang can be accessed by teachers and students through a search engine (browser) using the link https://elearning.sman5semarang.sch.id/ by login using the username and password provided by the school. Users outside the academic community of SMAN 5 Semarang can access *Elima* using a Google account and through guest mode (login as a guest).

Along with its development, there are many additional functions offered by Moodle in terms of optimizing learning, so that by utilizing the features appropriately it can overcome some problems in learning (Retnoningsih, 2017). According to Wicaksana et al. (2020), the components in Moodle have different functions to be developed according to the needs of their use. This is in line with the statement of Chang and Lan (2021) that Moodle is licensed under the General Public License (GPL), which is copyrighted but still allows anyone to copy, use, and modify it. Moodle also allows teachers to design varied online learning, so it does not seem monotonous. Moodle provides administrators and teachers with access to tools to vary all stages of the learning process starting with the delivery of material and

ending with evaluation (Morze, Varchenko-Trotsenko, Terletska, & Smyrnova-Trybulska, 2021).

In the context of learning from home in the midst of the Covid-19 pandemic, teachers use Moodle because it is practical, relevant, and can find out all student learning activities as well as in class. This is because Moodle can be designed and modified so that it can be adapted to the needs of students at SMAN 5 Semarang. Prior to the use of Moodle, there was training intended by teachers, but students did not receive certain training so that students learned to use the platform independently, but the biology learning process with Moodle in class XI went well and smoothly, and 90% of students were ready to take part in learning. online. On the other hand, the use of Moodle provides more advantages than disadvantages. Some of the advantages that Moodle has include: (1) easy access; (2) can monitor student activities during the learning process; and (3) the data obtained from Moodle is right on target according to face-to-face conditions. Wicaksana et al. (2020) stated that Moodle has several advantages that make this platform widely used as an e-learning development framework. Some of the advantages of Moodle include: (1) anyone can download Moodle software for free through the official website; (2) designed according to learning needs so that it is easy to use; (3) ease of installation process; (4) there are facilities for quizzes, assignments, and scoring that can be arranged as needed; (5) the student quota is large; (6) suitable for use as online learning media; (7) supports several file types that can be used as teaching materials; (8) learning materials are neatly arranged and can be grouped into several categories; (9) free to choose the type of language; and (10) equipped with a themes menu to change the display menu.

Besides the advantages, Moodle also has some disadvantages. The weaknesses of Moodle as described by Sulistyorini and Anistyasari (2020), include: (1) requiring a more thorough understanding of the system used; (2) require experts to build the desired e-learning system; (3) higher costs; (4) requires special hardware; (5) must install a special application to support Moodle; and (6) requires a high-speed internet network.

Teachers also use other platforms such as Google Meet and WhatsApp which are used as complements and variations during the learning process. Google Meet is used by teachers to interact directly with students, but Google Meet is rarely used because it is considered less effective. This is because the teacher cannot monitor student activity because students participate in learning on Google Meet by turning off the camera and microphone so that the teacher does not know whether the student is actually participating in the lesson or not. In biology learning, WhatsApp is also used to provide direction at the beginning of learning and as a medium for sharing important information related to learning such as informing exam schedules or deadlines for submitting assignments.

B. SMAN 15 Semarang

Online biology learning is carried out with using an e-learning platform called *PJJ Smart Libels* which is an academic system owned by SMA N 15 Semarang. The use of *PJJ Smart Libels* is an agreement from the school so that all teachers are required to use it in online teaching and learning activities. E-learning belonging to SMA N 15 Semarang can be accessed through the website address http://pjj.sman15smg.sch.id/ using username and password provided by the school. PJJ SMA N 15 Semarang itself was developed using a framework from one of the *Javascript* programming languages, namely *Handlebars.js*.

According to Katz (2019), the advantages of this framework are: (1) it can create attractive templates without significant obstacles, so it is very easy for developers because it is easy and fast; (2) compatible with *Mustache.js* framework which can ease and make it familiar to developers; (3) template execution is faster than most other templates which makes it lightweight and accessible.

The use of *PJJ Smart Libels* by teachers is also combined with Microsoft Office 365 as a complement to online learning. All students at SMA N 15 Semarang already have an account so they can access services from Microsoft Office 365 for free. The choice of Microsoft Office 365 is based on several reasons, including the capacity of files that can be attached to the Microsoft Office 365 forum is quite large and can be used for video conferencing or meetings. Not all products from Microsoft Office 365 are used in learning biology in class XI, but teachers only use Microsoft Teams and Microsoft Forms. This is because not all products from Microsoft Office 365 can be activated and used.

According to Withee, Withee, and Reed (2019) Microsoft Office 365 has several advantages, including; (1) can be used in all places through internet access; (2) facilitate collaboration with the team; (3) automatic and regular updates at no additional cost; (4) various packages that can be tailored to the needs; (5) provide additional platforms for communication and collaboration such as skype, SharePoint, and Lync online. In addition to its advantages, Microsoft Office 365 has several disadvantages described by Withee, Withee, and Reed (2019), including: (1) having quota limits in sending email; (2) must always be connected to the internet so that existing data is always stored and can be updated; (3) cost considerations because with the annual payment system it is necessary to consider so as not to cause school budget constraints. Teachers as parties who are directly involved in its use also convey some of the advantages and disadvantages of Microsoft Office 365.

Regarding the e-learning platform used, the teacher conveyed some of the obstacles experienced in carrying out online biology learning. The obstacles experienced by teachers include the following:

1. PJJ Smart Libels have several weaknesses in their use, including: (1) many students are late in submitting assignments because the assignment room at PJJ has passed the deadline; (2) if the student does not log in to the PJJ, then the student is recorded as absent or not attending the lesson; and (3) can only send one file in each learning room, so you have to create a new room if you want to send other files.
2. Microsoft Office 365 has a problem, namely not all of its products can be used, so teachers only use Microsoft Team and Microsoft Form. On the other hand, the teacher revealed that if all products from Microsoft 365 can be activated, then learning will take place more optimally.

Along with some of the challenges faced by teachers as mentioned above, the teacher explained that the readiness of students to take part in biology learning with the PJJ Smart Libels e-learning platform and Microsoft Office 365 can be said to be good. Most students have understood its use so that students are more enthusiastic and active in participating in learning, but there are a small number of students who do not take part in learning with various technical obstacles. The obstacles faced by students include not having a device, either a smartphone or a laptop that supports it, the limited number of quotas, and difficulties in accessing internet signals.

C. SMAN 16 Semarang

The e-learning platforms used by teachers in learning biology are Google Classroom, Google Meet, and WhatsApp. In its use, the three platforms synergize and complement each other to create an online learning climate that is conducive and does not burden students. Google Classroom is a learning platform owned by Google and can be used for free (Tinungki & Nurwahyu, 2020). The use of Google Classroom is based on several careful considerations by the teacher. The teacher's considerations using Google Classroom include: (1) being able to share learning materials in the form of videos and documents (2) being practical for collecting assignments and being able to monitor the timeliness of students in

collecting assignments; and (3) more compact because the collected tasks are stored and viewed in Google Drive so it doesn't cause smartphone storage to fill up quickly.

Google Classroom also offers convenience, namely in its application it can be integrated with several other Google products such as Google Forms, YouTube, and Google Drive. This is in line with Tinungki and Nurwahyu's (2020) statement which explains that Google Classroom combines Google Drive for the creation and collection of assignments, Google Docs, Slides, and Slides for writing, Gmail for communicating, and Google Calendar for scheduling lessons. Related to its use, various types of media from Google products such as YouTube videos and Google Drive files can be attached and integrated into announcements and posts to share content in Google Classroom (Hidayat & Nurcahyanto, 2018).

Fernando (2020) states that applications contained in the Google Suite for Education collaborate with each other to realize the ideal quality of learning. Google Classroom also has features that can monitor and stimulate student activities such as attendance, forums and can be integrated with other Google products. Another advantage offered by Google Classroom to make it easier for users is that it can be used on various devices, both PCs and smartphones, and can be accessed through mobile applications and search engines.

Several e-learning platforms used by teachers have their respective advantages and disadvantages, because the three platforms mentioned above are used together so that they support and complement each other. Google Classroom in its use can be used as a means to deliver material and discussion forums, but Google Classroom cannot be used for video conferencing. WhatsApp can also be used to share material and discuss through group rooms, and can be used to make video calls, but the number of participants is very limited so it cannot accommodate the number of students in one class. Therefore, teachers use Google Meet as a platform to conduct video conferencing because the participant capacity is large enough so that all students can join. Google Meet is also equipped with a message field so that it can be used for online presence and sharing material in the form of a link, but the data stored in the message field will be lost when the video conference ends.

D. MAN 1 Semarang

Referring to the results of research that has been carried out, it can be seen that teachers do not only use one e-learning platform, but a combination of several platforms, including Madrasah E-learning, Google Suite for Education (GSE), WhatsApp, and Quipper. Some of these platforms have their respective roles in the biology learning process and are mutually supportive and complementary. Its use is also adjusted to the subject matter presented in order to create a more optimal biology learning climate.

The selection of an e-learning platform to conduct biology learning is done with a careful consideration in advance, so that teachers have strong reasons so that the platform is used in learning. This is because the madrasa has provided internal training (in house) to all teacher councils within the scope of MAN 1 Semarang. This has a positive impact on teachers so that teachers can gain knowledge and experience about various e-learning platforms and their technical operations in carrying out online teaching and learning activities. Some of the teacher's considerations in choosing an e-learning platform in biology learning in class XI include the following:

E-learning MAN 1 Semarang is used because it can monitor student attendance and make it easier to recapitulate the percentage of student attendance. Google Suite for Education is used because the features offered are very diverse and in accordance with the needs of teachers and students in the online teaching and learning process and its services can be accessed freely (open source).

Quipper School is used because it can easily access learning videos of practice questions and their discussions. The madrasa has also subscribed to Quipper School so that teachers

and students can take full advantage of all the services in it. While, WhatsApp is used because it is considered practical and easy to operate, and is a communication application that is quite familiar among students so that almost all students have installed WhatsApp on their respective smartphones..

The various services available in madrasa e-learning allow the creation of ideal online learning, but in practice, biology subject teachers do not use madrasa e-learning as a whole and comprehensively in carrying out learning. In practice, madrasa e-learning is more often used to monitor student attendance and is rarely used to deliver learning materials or discuss with students. Madrasa e-learning has advantages and disadvantages in its application. The advantages of e-learning madrasas are that they are economical and can monitor student attendance easily, while the weakness is the difficulty in accessing the madrasa e-learning website which is relatively slow.

Google Suite for Education is a service that provided by Google for the world of education that can be used as a communication solution in collaborating so as to improve students' collaborative abilities (Talib, Suaedi, & Ilyas, 2021). In line with this, Mobo (2021) also said that Google Suite for Education can be an alternative learning platform that students like, especially the Google Meet service with its advantages in terms of speed, reliability, security, setup, and an economical price.

Quipper School is a platform that connects students and teachers in distributing online subject matter and assignments that can be accessed via the website or mobile application with flexible times and places. Quipper School was initiated by Masayuki Watanabe in London in December 2010. Quipper School has several advantages, including: (1) providing interesting and easy-to-understand teaching materials and practice questions for students; (2) providing materials for all subjects for students in grades X, XI, XII that have been adapted to the curriculum in Indonesia; (3) make it easier for teachers to monitor student learning activities because there are data analysis services of student development; (4) students can access the subject matter at any time and in all places; (5) teachers and students can discuss directly and easily through messaging services; (6) changing the role of passive students to become more active; (7) efficient in terms of time, place, and cost (Quipper Indonesia, 2014). In addition to some of the advantages of Quipper School that have been mentioned, the teacher explained that the use of Quipper School has a weakness, namely it can reduce the creativity of teachers in teaching. This is because on the Quipper platform there are materials and practice questions that are equipped with discussions.

WhatsApp is also one of the e-learning alternatives used by teachers. The use of the WhatsApp application is based on several reasons expressed by the teacher, including the ease of access and familiar operation, minimalist quota, and practicality. This is in line with Anugraha's statement (2020) that the reason teachers choose to use WhatsApp is that it is practical, easy to understand by students and more effective because it does not spend too much quota during the learning process. Another advantage of WhatsApp is that it is easy to operate and send questions and materials, and if the teacher wants to have a virtual meeting, you can use the video call feature.

E. MAN 2 Semarang

Based on the research results, it is known that online biology learning in class XI uses an e-learning platform in the form of the WhatsApp communication application (specifically on WhatsApp groups) and madrasa e-learning. The use of WhatsApp in learning acts as the main e-learning that is used for delivering subject matter and collecting assignments online, while madrasa e-learning is used as a means to monitor student attendance (presence) in learning.

Teachers choose WhatsApp as an e-learning platform in learning because other e-learning applications are rarely activated by students, so teachers choose WhatsApp as an alternative in conducting learning. This is because almost all students have installed the WhatsApp communication application on their personal smartphones and students are also very familiar with the features and how to operate it so that the use of WhatsApp is felt to make it easier for students to take biology lessons online. WhatsApp is one of the popular communication applications used by the majority of the population in Indonesia and even the world. Kaur and Singh (2021) explain that the popularity of WhatsApp is growing day by day in the digital realm. The tendency of people to use WhatsApp Messenger is increasing due to its high quality and good communication skills.

The use of WhatsApp is also integrated with madrasa e-learning which makes it easier for teachers to monitor and recap the percentage of student attendance, because WhatsApp is considered less effective when used to monitor student attendance. Madrasah e-learning is a learning platform released by the Ministry of Religion of the Republic of Indonesia for all Madrasas ranging from Roudlotul Athfal (RA) to Madrasah Aliyah (MA). E-learning madrasas can be accessed flexibly 24 hours by users as long as they have internet access as well as a username and password to enter e-learning. Madrasa e-learning has been updated several times in order to add and improve existing features, the latest version is version 2.0.0 which is equipped with video conferencing features that can be used by educators and students to communicate and share learning materials directly (Hikmah, 2020).

There are several advantages possessed by e-learning madrasas according to Fitriani et al. (2020), namely: (1) can be accessed via a computer, laptop or smartphone; (2) can be accessed flexibly, without limitation of space, time and place; (3) can contain various features to support the distance learning process (PJJ); (4) each user has an account with a username and password so that the security is guaranteed; (5) educators can be active and creative in learning; (6) means of communication between educators and students; (7) student activity control device; (8) means of delivering material; and (9) accommodate all assignments, both documents, pdfs and videos.

WhatsApp as a means of online learning has advantages and disadvantages in its application. According to the results of interviews with teachers, several advantages of WhatsApp in learning, including assignments can be done at any time, there is time tolerance for those who are late in submitting assignments, and its practical and easy use. In addition, the weakness of WhatsApp delivered by the teacher is that students do not understand the material presented in its entirety and thoroughly. This was also conveyed by Al Wahid et al. (2020) that the delivery of material through communication applications such as WhatsApp often creates different views on the material presented either through learning videos or chatting. However, teachers always try their best to minimize various obstacles and obstacles in online learning.

Conclusion

The use of e-learning platforms in biology subjects is adjusted to the learning objectives and students' readiness to use them. The e-learning platforms used by biology teachers in class XI SMA and MAN in Semarang City are very diverse and can be grouped into three types, namely instant messaging platforms, video conferencing, and Learning Management System (LMS). The instant messaging platform used is WhatsApp. The video conferencing platforms used are Google Meet and Microsoft Team. The LMS platforms used are Moodle, Google Classroom, Microsoft Office 365, and Madrasah E-learning. It can be seen that each school uses a different type of platform and is adapted to school policies and student needs. Some schools develop their own e-learning platforms to support online learning so that their

use is required, but this does not limit teachers to integrating it with other platforms so that learning can be carried out more effectively.

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References

Al Wahid, S. M., Fantiro, F. A., & Kusnadi, D. (2020). Persepsi Mahasiswa dalam Penggunaan Ragam Platform Pembelajaran Daring. JP2SD (Jurnal Pemikiran dan Pengembangan Sekolah Dasar), 8(2), 170–178. https://doi.org/10.22219/jp2sd.v8i2.15030

Anugrahana, A. (2020). Hambatan, Solusi dan Harapan: Pembelajaran Daring Selama Masa Pandemi Covid-19 Oleh Guru Sekolah Dasar. Scholaria: Jurnal Pendidikan dan Kebudayaan, 10(3), 282–289. https://doi.org/10.24246/j.js.2020.v10.i3.p282-289

Batubara, B. M. (2021). The Problems of the World of Education in the Middle of the Covid-19 Pandemic. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 4(1), 450–457. https://doi.org/10.33258/birci.v4i1.1626

Chang, M. M., & Lan, S. W. (2021). Exploring Undergraduate EFL Students Perceptions and Experiences of a Moodle-Based Reciprocal Teaching Application. Open Learning: The Journal of Open, Distance and e-Learning, 36(1), 29–44. https://doi.org/10.1080/02680513.2019.1708298

Fernando, A. (2020). Respon Mahasiswa terhadap Proses Pembelajaran Biologi Melalui Google Classroom di Universitas Maritim Raja Ali Haji. Pedagogi Hayati: Jurnal Ilmiah Pendidikan Biologi, 4(1), 10–18. https://doi.org/10.31629/ph.v4i1.2335

Fitriani, N. S., Syarifah, & Susanto, A. (2020). Pembelajaran Bahasa Arab Interaktif Melalui Media E-Learning Madrasah Di MTsN 1 Kota Malang. Jurnal Pendidikan Ilmiah, 5(2), 159–182.

Gunawan, Suranti, N. M. Y., & Fathoroni. (2020). Variations of Models and Learning Platforms for Prospective Teachers During the COVID-19 Pandemic Period. Indonesian Journal of Teacher Education, 1(2), 61–70.

Hidayat, M. L., & Nurcahyanto, G. (2018). Analisis Kesesuaian Google Classroom sebagai LMS pada Mata Kuliah Strategi Pembelajaran Biologi di FKIP UMS. Proceeding Biology Education Conference, 15(1), 572–576.

Hikmah, S. (2020). Pemanfaatan E-learning Madrasah Dalam Pelaksanaan Pembelajaran Jarak Jauh Masa Pandemi di MIN 1 Rembang. Jurnal Edutrained: Jurnal Pendidikan dan Pelatihan, 4(2), 73–85. https://doi.org/10.37730/edutrained.v4i2.81

Katz, Y. (2019). Handlebars. Diambil 27 Mei 2021, dari https://handlebarsjs.com/

Kaur, A., & Singh, A. (2021). Remarkable Contribution of Whatsapp in Community. Advances in Mathematics: Scientific Journal, 10(3), 1413–1418. https://doi.org/10.37418/amsj.10.3.30

Kementerian Pendidikan dan Kebudayaan. Surat Edaran Nomor 4 Tahun 2020 Tentang Pelaksanaan Kebijakan Pendidikan Dalam Masa Darurat Penyebaran Coronavirus Disease (Covid-19). , Pub. L. No. Surat Edaran Nomor 4 Tahun 2020, 1 (2020).

Kurniati, T., Yusup, I. R., Hermawati, A. S., & Kusumahwardani, D. (2021). Respon Guru Terhadap Kendala Proses Pembelajaran Biologi di Masa Pandemi COVID-19. Jurnal Educatio, 7(1), 40–46. https://doi.org/10.31949/educatio.v7i1.765

Mobo, D. F. (2021). The Impact of Google Education Suite amidst the Pandemic: The New

Normal Approach. Icontech International Journal, 5(1), 1–4. https://doi.org/10.46291/icontechvol5iss1pp1-4

Morze, N., Varchenko-Trotsenko, L., Terletska, T., & Smyrnova-Trybulska, E. (2021). Implementation of Adaptive Learning at Higher Education Institutions By Means of Moodle LMS. Journal of Physics: Conference Series, 1840, 1–13. https://doi.org/10.1088/1742-6596/1840/1/012062

Nadziroh, F. (2017). Analisa Efektifitas Sistem Pembelajaran Berbasis E-Learning. Jurnal Ilmu Komputer Dan Desain Komunikasi Visual (Jikdiskomvis), 2(1), 1–14.

Nafi'ah, J. (2021). Adaptasi Pembelajaran E-Learning dan Blended Learning di Era New Normal Pada Peserta Didik Madrasah Ibtidaiyah. Jurnal Auladuna, 3(1), 23–36. https://doi.org/https://doi.org/10.36835/au.v3i01.476

Padli, F., & Rusdi. (2020). Respon Siswa dalam Pembelajaran Online Selama Pandemi. Social Landscape Journal, 1(3), 1–7.

Quipper Indonesia. (2014). Quipper School Indonesia. Diambil 27 Mei 2021, dari indonesia.quipperschool.com

Retnoningsih, E. (2017). Perbandingan Learning Management System Edmodo dan Moodle Dalam Pembelajaran Online. Information System for Educators and Professionals, 1(2), 221–230.

Saifuddin, M. F. (2017). E-Learning Dalam Persepsi Mahasiswa. Jurnal VARIDIKA, 29(2), 102–109. https://doi.org/10.23917/varidika.v29i2.5637

Sayekti, S. P., Faridah, E. S., & Ningrum, R. S. (2021). Implementasi E-Learning dalam Sistem Pembelajaran Jarak Jauh pada Mata Pelajaran PAI di SMA IT Pesantren Nururahman. Jendela ASWAJA, 2(1), 10–18.

Setiaji, B., Ariadi, P., & Dinata, C. (2020). Analisis Kesiapan Mahasiswa Jurusan Pendidikan Fisika Menggunakan E-learning dalam Situasi Pandemi Covid-19. Jurnal Inovasi Pendidikan IPA, 6(1), 59–70. https://doi.org/10.21831/jipi.v6i1.31562

Sulistyorini, L., & Anistyasari, Y. (2020). Studi Literatur Analisis Kelebihan dan Kekurangan LMS Terhadap Pembelajaran Berbasis Proyek pada Mata Pelajaran Pemrograman Web di SMK. IT-Edu: Jurnal Information Technology and Education, 5(1), 171–181.

Talib, A., Suaedi, & Ilyas, M. (2021). Pembelajaran Matematika Berbasis Google Suite for Education Untuk Meningkatkan Kecakapan Kolaboratif Siswa. Teorema: Teori dan Riset Matematika, 6(1), 34–47. https://doi.org/10.25157/teorema.v6i1.4470

Tinungki, G. M., & Nurwahyu, B. (2020). The Implementation of Google Classroom as the E-Learning Platform for Teaching Non-Parametric Statistics during COVID- 19 Pandemic in Indonesia. IJAST: International Journal of Advanced Science and Technology, 29(4), 5793–5803.

Velavan, T. P., & Meyer, C. G. (2020). The COVID-19 Epidemic. Tropical Medicine and International Health, 25(3), 278–280. https://doi.org/10.1111/tmi.13383

Wicaksana, E. (2020). Efektifitas Pembelajaran Menggunakan Moodle Terhadap Motivasi dan Minat Bakat Peserta Didik di Tengah Pandemi Covid -19. EduTeach : Jurnal Edukasi dan Teknologi Pembelajaran, 1(2), 117–124. https://doi.org/10.37859/eduteach.v1i2.1937

Withee, R., Withee, K., & Reed, J. (2019). Microsoft Office 365 for Dummies (Third). New Jersey: John Wiley & Sons, Inc