Student Perception of Online Learning Media Platform During the Covid-19 Pandemic

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A B S T R A K

Pembelajaran masa Pandemi Covid-19 menuntut dosen agar mampu beradaptasi dengan menggunakan platform pembelajaran online. Akibatnya muncul persepsi yang berbeda-beda dari mahasiswa terkait efektivitas dari masing-masing platform tersebut. Tujuan penelitian ini adalah mengalisis perbedaan persepsi mahasiswa tentang efektivitas penggunaan platform WhatsApp, Google Classroom dan Zoom. Metode penelitian ini menggunakan metode kuantitatif untuk mengukur tingkat persepsi dan dikombinasikan dengan metode kualitatif untuk menganalisis persepsi mahasiswa. Metode pengumpulan data dilakukan dengan cara membagikan kuesioner melalui google formulir kepada mahasiswa. Analisis yang digunakan adalah analisis kuantitatif dengan menggunakan penghitungan statistik dan analisis kualitatif untuk menganalisis persepsi mahasiswa. Hasil penelitian menunjukkan fakta perbedaan persepsi dalam penggunaan WhatsApp dan Google Classroom signifikan dengan perbedaan rata-rata 16,933 yang berarti tingkat persepsi WhatsApp lebih tinggi dari Google Classroom. Perbedaan persepsi dalam penggunaan WhatsApp dan Zoom signifikan dengan perbedaan rata-rata 15,2 yang berarti tingkat persepsi WhatsApp lebih tinggi dari Zoom. Perbedaan persepsi dalam penggunaan Zoom dan Google Classroom tidak signifikan dengan perbedaan rata-rata 1,733 yang berarti tingkat persepsi zoom sedikit lebih tinggi dari Google Classroom. Penelitian ini menyimpulkan bahwa persepsi mahasiswa lebih tinggi pada platform Grup WhatsApp, kemudian Zoom dan terakhir Google Classroom. Pembelajaran online seharusnya terlebih dahulu menggunakan platform WhatsApp, kemudian Zoom, dan terakhir Google Classroom.

A B S T R A C T

Learning during the Covid-19 Pandemic requires lecturers to be able to adapt by using online learning platforms. As a result, there are different perceptions of students regarding the effectiveness of each of these platforms. The study aimed to analyze differences in students' perceptions about the effectiveness of using WhatsApp, Google Classroom, and Zoom platforms. This research method uses quantitative methods to measure the level of perception and is combined with qualitative methods to analyze student perception. The data collection method is done by distributing questionnaires through Google forms to students. The analysis used is a quantitative analysis using statistical calculation and qualitative analysis to analyze student perception. The results showed that the difference in perception in WhatsApp and Google Classroom usage was significant with an average difference of 16.933 which means WhatsApp's perception levels are higher than Google Classroom. The difference in perception in WhatsApp and Zoom usage is significant with an average difference of 15.2 which means WhatsApp's perception level is higher than zoom. The difference in perception in Zoom and Google Classroom usage is insignificant with an average difference of 1.733 which means Zoom's perception rate is slightly higher than Google Classroom. The study concluded that student perceptions were higher on the WhatsApp Group platform, then zoom, and finally Google Classroom. Online learning should first use the WhatsApp platform, then zoom, and finally Google Classroom.

1. INTRODUCTION

March 11, 2020, is the establishment of the COVID-19 pandemic (Gunawan & Fathoroni, 2020). This pandemic first appeared in the city of Wuhan, one of the cities in China (Khan & Fahad, 2020). Coronavirus spread rapidly to 33 countries. Seventy-eight thousand nine hundred sixty-six patients died from coronavirus in early 2020 (Chen et al., 2020). WHO, as an international organization responsible for the health sector,

established March 11, 2020, as the Corona Pandemic Day (Mona, 2020). UNESCO noted there were 290 million students (students and students) who were disrupted in the learning process, due to the closure of schools and campuses (Purwanto et al., 2020). Students who are accustomed to studying together on campus must be avoided. The application of online learning models is one solution, so students can still learn without having to gather with their friends (Daniel, 2020). Online learning is an alternative that can be applied in the era of high technology and communication as it is today (Putrawangsa & Hasanah, 2018; Schneider & Council, 2020). Lecturers and students are required to adapt from conventional learning to online learning. In practice, many lecturers take advantage of group chat apps like Google Classroom, WhatsApp Group, and use video conferencing apps like Zoom when face-to-face discussions are needed (Gunawan & Fathoroni, 2020). However, this gives rise to various perceptions both negative and positive, the negative side of the online learning system is that not all students have the same level of understanding to operate devices and internet network problems such as depleted quotas. Internet networks often experience errors if they are in remote areas (Meiza et al., 2020; Sari et al., 2020). Access to difficult communication for guidance and discussion with lecturers becomes another problem that many students feel (Patricia Aguilera-Hermida, 2020). These negative perceptions can affect the readiness of students in attending college to decrease (Saifuddin, 2018).

Some students understand the positive side of online learning. This perception arises after several times they do online lectures, which are considered simpler (Verawardina et al., 2020). For discussion-based conferences, it is more appropriate to use the Zoom platform because it is more communicative with lecturers and between students. Meanwhile, to establish a more appropriate platform to use is WhatsApp Group or Google Classroom. Students feel progress in the college process. Lectures now seem more flexible and have more usability value (Yulia, 2020). This research is important to do because it determines the level of perception of students in doing online learning. The resulting level of perception will be used for online learning evaluation materials. Through the evaluation process, the implementation of WhatsApp Group, Google Classroom, and Zoom platforms can be done better and produce more optimal college results (Kastrena et al., 2020). Students will feel comfortable if the three platforms are implemented with their respective backgrounds so that even though they are physically far apart, the talks can go well (Sadikin et al., 2020). The previous research shows students prefer platforms that contain recording features to be able to be stored and relearned. The existence of recording features is considered more effective to improve learning (Muthuprasad et al., 2021). If we look at the reason then the right platform is Zoom because it provides a meeting recording feature with a good level of sound and video clarity (Muthuprasad et al., 2021). Another study shows that the most appropriate platform for lecture activities is Zoom (Almahasees et al., 2021). Communication outside the lecture is more effective using the WhatsApp platform (Almahasees et al., 2021). The learning platform used should provide features of group discussion activities, debates, play, scenario-making, team projects, or other collaborative activities (Rugube et al., 2020).

The author is interested in analyzing the needs of online learning along with an effective platform to use. Online learning platforms should be determined by adjusting the needs needed in learning activities (Almahasees et al., 2021). In addition, the selected platform must provide facilities for lecturers to supervise the overall lecture process (Katsarou, 2021). Online learning platforms must also adjust the character of students. Differences in student residence greatly affect the difference in accessible signals. Then the online learning platform selected must reach all students without anyone being harmed. Online learning platforms must also weigh each student's financial ability to meet internet quotas (Solis-Foronda & Marasigan, 2021). Do not let the selected platform only facilitate certain students but harm other students. Through this research can be known the effectiveness of each platform used during learning during the Covid-19 pandemic. The results obtained from this study can be taken into consideration for lecturers in determining the platform when going to carry out online learning (Muthuprasad et al., 2021; Wargadinata et al., 2020). Thus the lecturer is on target to apply his learning because it has adjusted the background of all students without anyone left behind (Shi & Lin, 2021). It is expected that with the results of this study every student can follow the learning process well without being constrained by technical constraints. Students are also expected to get a maximum understanding of the lecture material and can have active discussions if there is a lack of understanding (Rugube et al., 2020; Yulia, 2020). By referring to the results of this research the goal of learning will be achieved easily.

2. METHOD

Most of the styles are intuitive. However, we invite you to read carefully the brief description below. The research method used is Mixed Methods (Gläser-Zikuda et al., 2020; Kansteiner & König, 2020). The implementation of this research includes qualitative and quantitative methods. Researchers collect, analyze quantitative and qualitative data in the same study (Senjaya, 2018). The variable studied was students' perceptions regarding the use of platforms (WhatsApp Group, Google Classroom, Zoom) in the online learning

process. Before compiling the instrument, the researcher first determines the indicators that form the basis of the preparation of statement items and makes the research instrument grid (Istikomah & Jana, 2019). After the signs are determined, then make a lattice of instruments in the form of a questionnaire followed by the preparation of tools that will be used for research. The survey used by researchers is a questionnaire through Google Forms. The response used in this study were students of the Historical Education Study Program Faculty of Teacher Training and Education, Yogyakarta PGRI University. The intrusion grid used can be seen in Table 1.

Table 1. Perception Instrument Grid of Learning Media Platforms

	Platform	Indicators	Sub-indicator	Statement Item
1.	WhatsApp Group	Skills	Usage cost	*1
			Network power	2, *3
			Optimization facilities	4
2.	Google Classroom	Knowledge	Understanding of the material	5
			Ease of interaction	6, *7
		Learning Process	Document access	8, 9
3.	Zoom		Time efficiency	*10
*Negative statement				

The research instrument that was prepared was then validated by an expert to be given suggestions, opinions, and improvements. Then empirical validation was done through research instrument trials (Marvasti, 2019). Researchers have examined by filling out a questionnaire through Google Form. Researchers have sent questionnaire links to respondents via WhatsApp messages. Data analysis was performed after carrying out all the research processes, namely filling out questionnaires by respondents (Gläser-Zikuda et al., 2020; Marvasti, 2019). The data processing has been adjusted to the existing theory to maximize the results of the analysis needed.

3. RESULT AND DISCUSSION

Result

Before conducting research, the instruments used in the study were tested for logical and empirical validity. The tool used in the trial consisted of 30 questions based on student perception indicators. The initial stage is valid validity; the questionnaire instrument used has been validated by the material expert (validator). The results of the general questionnaire assessment conducted by the validator are the right questionnaire instruments, and the questionnaire can be used with revisions. The results of an instrument trial to assess empirical validity, which was declared valid and used in the study, were 18 items. The average questionnaire results regarding students' perceptions of using platforms (WhatsApp Group, Google Classroom, Zoom) can be seen in Figure 1.
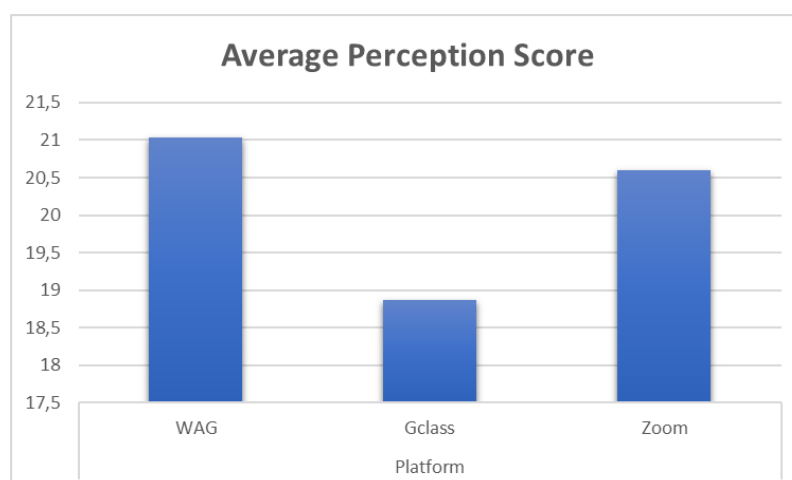

Figure 1. Average Perception Score

Figure 1 shows that the perception of students in using WhatsApp Group in online learnings is very high compared to using the other two platforms. Also visible, Zoom is better than Google Classroom in online-

based lecture media. The qualitative data obtained was the result of students' perceptions of each instrument item. Student comments, criticisms, and suggestions are part of student perceptions during online learnings using the WhatsApp Group, Google Classroom, and Zoom applications. The qualitative data obtained is used to support quantitative data in more depth and critically. Student perceptions based on qualitative data explain the high perception of students towards the WhatsApp Group platform. The Zoom Platform ranks second in student perception, after that the Google Classroom platform. The results of the questionnaire regarding students' perceptions of using platforms (WhatsApp Group, Google Classroom, Zoom) for online learning were then tested for normality. Table 2 shows the results of the normality test using Kolmogorov-Smirnov.

Table 2. Normality Test Results

Platform	Nilai Asymp.Sig
WhatsApp Group	0.207
Google Classroom	0.759
Zoom	0.117

Asymp sig value from the three online learning media platforms > 0.05, meaning that the data obtained is based on a normally distributed questionnaire. Furthermore, each online lecturing media platform was tested for different perceptions of students in the use of the media. Table 3 is the result of the perception difference test using one-way ANOVA.

Table 3. Test results on differences in student perception

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5207.822	2	2603.911	195.721	0.000
Within Groups	1157.467	87	13.304		
Total	6365.289	89			

Based on Table 3, the F value was 195.721, and the sig value was 0.000 < 0.05, which means that there were differences in students' perceptions in using online lecturing media between WhatsApp Group, Google Classroom, and Zoom. Furthermore, the significance of each online media platform is tested. Table 4 is a test of the significance of the differences in each of the online learning media platforms used.

Table 4. Test the significance of differences

Platform	Average Difference	Sig	Testing	Decision
WAG VS Google Classroom	16.933	0.000	SIG < 0.05	Sig
WAG VS Zoom	15.200	0.000	SIG < 0.05	Sig
Zoom VS Google Classroom	1.733	0.163	SIG > 0.05	Not sig

Discussion

Qualitatively there are differences in student perceptions between lectures using WhatsApp group, Google classroom, and zoom. WhatsApp Group is widely used in conferences that require photographic processes such as sharing documents, then reading individually, and followed by a question and answer via messages in the Group (Hutami & Nugraheni, 2020). This application is much popular with students because it has been a long time operating before the COVID-19 pandemic, so it is considered efficient for use as an online learning medium. Google Classroom is also often used in lectures that are a sufficiently descriptive process. But google classroom has more sophisticated features than WhatsApp Group. Documents, pictures, and videos are more easily displayed in more detail and clarity in the application (Sabran & Sabara, 2019). Students like many because of the ease of operation, although they must always be refreshed to be able to read messages that have just arrived from lecturers or classmates. Student perceptions look different when online learnings are carried out using the zoom application. Student perception seems low because this application requires a strong signal to be applied smoothly. Some students find it challenging to be in an area with a little sign. But for lectures that require discussion, this application is much loved by students because the debate can be held face to face. Every question can be responded to directly by the presenter or lecturer (Mustakim, 2020).

Table 4 shows that differences in students' perceptions in using the WhatsApp Group and Google Classroom are quite significant, with a mean difference of 16,933. This difference is supported by qualitative data on a questionnaire that explains that the WhatsApp Group is more familiar than Google Classroom. Students have used the WhatsApp Group for daily communication before the COVID-19 pandemic, so it is

straightforward to use the WhatsApp Group for lectures (Sartika, 2018). It is different from Google Classroom that has never been used by students before the COVID-19 pandemic, so it takes time for adaptation. Students' perceptions favor WhatsApp Group compared to Google Classroom also because WhatsApp Group has a star feature that is useful for capturing incoming messages, so students do not miss incoming messages. In contrast, Google Classroom has no star features. WhatsApp Group is also supported by notifications when there are incoming messages that are useful for students always to monitor incoming messages. At the same time, Google Classroom needs to be refreshed first to see the incoming signals, and this makes students feel bored.

The significance of the WhatsApp Group and Zoom tests resulted in an average difference of 15.2. These results prove that WhatsApp Group is significantly better than Zoom. Qualitative data support this significant difference that the use of the WhatsApp Group for lectures only requires a small amount of quota, in contrast to Zoom, which involves a lot of allowances. The use of Zoom will stop if, in the middle of a student quota discussion runs out. Another difference is that the WhatsApp Group does not need a strong signal to use. The lecture will continue to be active even with a low sign (Antasari & Novianti, 2019), in contrast to Zoom, which always requires a high signal from the beginning of the lecture to the end. This makes it difficult for students who live in the village, and they must find a place that is high in the signal. Not a few students stopped studying for a moment to buy a quota because it ran out. Some students look for wifi first before lectures begin.

Zoom significance test with Google Classroom results in a mean difference of 1,733, meaning that Zoom is better than Google Classroom, but the difference is not significant. This finding is reinforced by the research. Zoom platform is considered more communicative for the implementation of online lectures (Kastrena et al. 2020); Muthuprasad et al., 2021). The Zoom platform also provides a face-to-face discussion space so that each question can be answered directly by the presenter or lecturer. In addition, the recording feature on the Zoom platform can also make it easier for students to relearn learning that has passed. In contrast to Google Classroom, discussions are carried out only through messages in groups, so students cannot be observed in their activities and order by lecturers. The significance test results are not significant, and the qualitative data can explain that the Zoom platform has a shortage that must stop every 40 minutes because the lecturer who is hosting does not use the paid zoom application. Repetition every 40 minutes makes students bored and lose concentration on the previous material. Also, the Zoom platform requires a lot of data packages to be used smoothly (Soni et al., 2018; Wargadinata et al., 2020).

The advantage of this research is that the data platform used is by the perception of students based on their experience when carrying out learning. In addition to calculating quantitative data with statistics, researchers also corroborate the results of research with qualitative data related to student perception. The results of the research can be used as a reference for lecturers in determining online learning platforms. When lecturers apply to learn by adjusting the results of this research, learning will become more effective. The limitation of this study is the difficulty of finding data from the History Education Study Program on other campuses so that researchers only take samples in the Historical Education Study Program of the Faculty of Teacher Training and Education, PGRI Yogyakarta University. It should be for lecturers when going to carry out online learning to use the Zoom platform first if in learning there are activities involving students. If learning for communication. Lecturers need to use the WhatsApp platform if the learning is done only requires the transfer of information to students. While the Google Classroom platform is used if there are task delivery activities and monitoring student learning activities that do not have presentations and discussions.

4. CONCLUSION

The implementation of online learning must be adjusted to the background and condition of students. The learning platform used should consider how effective it is for students of different backgrounds and regional conditions. Lecturers need to evaluate how effective the learning has been carried out so far. Student perceptions need to be well-received for the sake of improvement of learning in the future. The perception of students that online learning does not facilitate the role of students in presentations and discussion, then lecturers should use the Zoom platform that is proven effective for learning based on student activities. The WhatsApp Group platform is appropriate for student assignments and Google Classroom is appropriately used for activity-based learning other than discussions and presentations. If lecturers implement these platforms by the results of this research then online learning will run effectively and will result in high learning achievements.

5. REFERENCES

Almahasees, Z., Mohsen, K., & Amin, M. O. (2021). Faculty's and Students' Perceptions of Online Learning During COVID-19. *Frontiers in Education*, *6*(May), 1–10. https://doi.org/10.3389/feduc.2021.638470.

Antasari, I. W., & Novianti, W. (2019). Pemanfaatan Grup Whatsapp Pada Komunitas Kelas Menulis Pustakawan (KMP). *Medium Jurnal Ilmiah Fakultas Ilmu Komunikasi Universitas Islam Riau*, *7*(1), 18–25. https://journal.uir.ac.id/index.php/Medium/article/view/3126.

Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y., Qiu, Y., Wang, J., Liu, Y., Wei, Y., Xia, J., & Yu, T. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China : a descriptive study. *The Lancet*, *395*(10223), 507–513. https://doi.org/10.1016/S0140-6736(20)30211-7.

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *PROSPECTS*, *0123456789*. https://doi.org/10.1007/s11125-020-09464-3.

Gläser-Zikuda, M., Hagenauer, G., & Stephan, M. (2020). The potential of qualitative content analysis for empirical educational research. *Forum Qualitative Sozialforschung*, *21*(1). https://doi.org/10.17169/fqs-21.1.3443.

Gunawan, S. N. M. ., & Fathoroni. (2020). Variations of Models and Learning Platforms for Prospective Teachers During the COVID-19 Pandemic Period. *Teacher Education*, *1*(2), 61–70. https://scholar.google.co.id/citations?user=rBoKS7EAAAAJ&hl=id&oi=sra.

Hutami, M. S., & Nugraheni, A. S. (2020). *Metode Pembelajaran Melalui Whatsapp Group Sebagai Antisipasi Penyebaran Covid-19 pada AUD di TK ABA Kleco Kotagede*. *9*(1), 126–130. https://doi.org/10.26877/paudia.v9i1.6107.

Istikomah, D. A., & Jana, P. (2019). Mathematical Problem Solving Ability in Apos Modified Learning Model (M-APOS). *Journal of Physics: Conference Series*, *1254*(1). https://doi.org/10.1088/1742-6596/1254/1/012071.

Kansteiner, K., & König, S. (2020). The role(s) of qualitative content analysis in mixed methods research designs. *Forum Qualitative Sozialforschung*, *21*(1). https://doi.org/10.17169/fqs-21.1.3412.

Kastrena, E., Setiawan, E., Patah, I. A., & Nur, L. (2020). *Indonesian Journal of Primary Education Pembelajaran Peer Teaching Berbasis Zoom Video sebagai Solusi untuk Meningkatkan Hasil Belajar Passing Bawah Bola Voli saat Situasi Covid 19*. *4*(1), 69–75. https://doi.org/10.17509/ijpe.v4i1.

Katsarou, E. (2021). The effects of computer anxiety and self-efficacy on L2 learners' self-perceived digital competence and satisfaction in higher education. *Journal of Education and e-Learning Research*, *8*(2), 158–172. https://doi.org/10.20448/JOURNAL.509.2021.82.158.172.

Khan, N., & Fahad, S. (2020). Critical Review of the Present Situation of Corona Virus in China. *SSRN Electronic Journal*, *January*. https://doi.org/10.2139/ssrn.3543177.

Marvasti, A. B. (2019). Qualitative Content Analysis : A Novice's s Perspective 2 . Qualitative Content Analysis versus Content Analysis. *Qualitative Social Research*, *20*(3), 132–133. https://www.qualitative-research.net/index.php/fqs/article/download/3387/4487?inline=1.

Meiza, A., Hanifah, F. S., Natanael, Y., & Nurdin, F. S. (2020). Analisis Regresi Ordinal untuk melihat Pengaruh Media Pembelajaran Daring terhadap Antusiasme Mahasiswa Era Pandemi Covid. *Digital Library UIN Sunan Gunung Jati*, 8. http://digilib.uinsgd.ac.id/30730/1/artikel KTI final asti dkk.pdf.

Mona, N. (2020). Konsep Isolasi dalam Jaringan Sosial untuk Meminimalisasi Efek Contagious (Kasus Penyebaran Virus Corona di Indonesia). *Jurnal Sosial Humaniora Terapan*, *2*(2), 117–125. https://doi.org/10.7454/jsht.v2i2.86.

Mustakim. (2020). Efektivitas Pembelajaran Daring Menggunakan Media Online Selama Pandemi Covid-19 Pada Mata Pelajaran Matematika. *Al asma: Journal of Islamic Education*, *2*(1), 1–12. http://journal.uin-alauddin.ac.id/index.php/alasma/article/view/13646.

Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during COVID -19 pandemic. *Social Sciences & Humanities Open*, *3*(1), 100101. https://doi.org/10.1016/j.ssaho.2020.100101.

Patricia Aguilera-Hermida, A. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, *1*(September), 100011. https://doi.org/10.1016/j.ijedro.2020.100011.

Purwanto, A., Pramono, R., Asbari, M., Santoso, P. B., Wijayanti, L. M., Hyun, C. C., & Putri, R. S. (2020). Universitas muhammadiyah enrekang. *Journal of Education, Psychology and Conseling*, *2*, 1–12. https://ummaspul.e-journal.id/Edupsycouns/article/view/418.

Putrawangsa, S., & Hasanah, U. (2018). Integrasi Teknologi Digital Dalam Pembelajaran Di Era Industri 4.0. *Jurnal Tatsqif*, *16*(1), 42–54. https://doi.org/10.20414/jtq.v16i1.203.

Rugube, T., Mthethwa-Kunene, K. E., & Maphosa, C. (2020). Promoting Interactivity in Online Learning – Towards the Achievement of High-Quality Online Learning Outcomes. *European Journal of Open Education and E-learning Studies*, *5*(2), 120–133. https://doi.org/10.46827/ejoe.v5i2.3381.

Sabran, & Sabara, E. (2019). Keefektifan Google Classroom sebagai media pembelajaran. *In Prosiding Seminar Nasional Lembaga Penelitian Universitas Negeri Makassar*, 122–125. https://ojs.unm.ac.id/semnaslemlit/article/download/8256/4767+&cd=2&hl=id&ct=clnk&gl=id.

Sadikin, A., Hamidah, A., Pinang, K., Jl, M., Ma, J., Km, B., Indah, M., Jaluko, K., Kode, K. M., & Indonesia, P. (2020). *Pembelajaran Daring di Tengah Wabah Covid-19 (Online Learning in the Middle of the Covid-19 Pandemic)*. 6(2), 109–119. https://doi.org/https://doi.org/10.22437/bio.v6i2.9759.

Saifuddin, M. F. (2018). E-Learning dalam Persepsi Mahasiswa. *Jurnal VARIDIKA*, *29*(2), 102–109. https://doi.org/10.23917/varidika.v29i2.5637.

Sari, W. P., Pramesti, D., & Kusuma, A. I. (2020). Student's Perception of Online Learning in Pandemic. *Proceeding "International Webinar on Education 2020,"* 201–207. http://103.114.35.30/index.php/Pro/article/view/5977.

Sartika. (2018). Kegunaan Whatsapp Sebagai Media Informasi dan Media Pembelajaran Pada Mahasiswa Ilmu Komunikasi STISP Persada Bunda. *Medium Jurnal Ilmiah Fakultas Ilmu Komunikasi Universitas Islam Riau*, *6*(2), 15–26. https://doi.org/10.25299/medium.2018.vol6(2).2408.

Schneider, S. L., & Council, M. L. (2020). Distance learning in the era of COVID-19. *Archives of Dermatological Research*, *0123456789*, 3–4. https://doi.org/10.1007/s00403-020-02088-9.

Senjaya, A. J. (2018). *Campuran (Mixed Method) Dalam Riset Sosial*. *4*(1), 103–118. https://doi.org/10.5281/zenodo.3552026.

Shi, Y., & Lin, X. (2021). Exploring the characteristics of adults' online learning activities: A case study of EDX online institute. *Research in Learning Technology*, *29*(1063519), 1–13. https://doi.org/10.25304/rlt.v29.2622.

Solis-Foronda, M., & Marasigan, A. C. (2021). Understanding the students' adversities in the science classroom. *Journal of Education and e-Learning Research*, *8*(1), 52–58. https://doi.org/10.20448/JOURNAL.509.2021.81.52.58.

Soni, Hafid, A., Hayami, R., Fatma, Y., Wenando, F. A., Amien, J. Al, Fuad, E., Unik, M., Mukhtar, H., & Hasanuddin. (2018). Optimalisasi Pemanfaatan Google Classroom Sebagai Media Pembelajaran Di SMK Negeri 1 Bangkinang. *Jurnal Pengabdian Untuk Mu NegeRI*, *2*(1), 17–20. https://doi.org/10.37859/jpumri.v4i1.

Verawardina, U., Asnur, L., Lubis, A. L., Hendriyani, Y., Ramadhani, D., Dewi, I. P., Darni, R., Betri, T. J., Susanti, W., & Sriwahyuni, T. (2020). Reviewing online learning facing the Covid-19 outbreak. *Talent Development and Excellence*, *12*(SpecialIssue3), 385–392. http://www.iratde.com/index.php/jtde/article/view/281.

Wargadinata, W., Maimunah, I., Dewi, E., & Rofiq, Z. (2020). Student ' s Responses on Learning in the Early COVID-19 Pandemic. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *5*(1), 141–153. https://doi.org/10.24042/tadris.v5i1.6153.

Yulia, H. (2020). Online Learning to Prevent the Spread of Pandemic Corona Virus in Indonesia. *ETERNAL (English Teaching Journal)*, *11*(1), 48–56. https://doi.org/10.26877/eternal.v11i1.6068.