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The Impact of Online Learning on Digital Literacy Skills in Higher Education: Survey Methods and Test Analysis

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ABSTRACT

Covid-19 Pandemic had impacts on the learning system in Indonesia, especially in Pekanbaru. It changes the system into online learning. Consequently, the Indonesian government should provide facilitation of the internet and other services in order to achieve successful learning. Hence, this paper provides a description of the influence that appeared from the learning system implemented on University students' digital literacy. Digital literacy is someone's ability to comprehend information as a learning source. The research uses a survey method in the form of a questionnaire and tests through SPSS. The result indicates that based on the two top universities in Pekanbaru by using stratified random sampling, there is no influence of online learning implementation for the two classes. Meanwhile, there is an influence for the four classes, which consisted of two classes that indicate positive influence and two classes that indicate negative influence. Nevertheless, preparation applied by the lecturer in online learning should be more arranged. It is because the biggest influence comes from outside.

Keywords*: *online learning, digital literacy

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INTRODUCTION

The pandemic impact on the educational context is commonly called Covid-19. The impact of Covid-19 on learning at school to the university level changes learning methods through online learning as an attempt to break down the Covid-19 outbreak (Garad et al, 2021; Syauqi et al, 2020; Wijaya et al, 2021). It means that the learning system used by every institution should be adapted to the situation. The online learning system used by every university utilizes the application of Google Meet, Zoom Meet, and WhatsApp through paid or free internet access (Khamparia, A., & Pandey, B, 2017; Zhang et al, 2020). Hence, online learning in the pandemic era did not indicate effectiveness and produce meaningful learning for students. It means a decrease in students' restricted movement influences learning quality, either in finding out the obstacle in the interaction with learning sources or the obstacle in the interaction with the environment widely like with fellow friends and teachers (Syaharuddin et al, 2021). The technology should be applied in the University as a digital tool and source for teaching and learning to find out the information needed (Kurniaman et al, 2022). Digital literacy or technology information literacy is overall the use and technology ability as a communication device to obtain, control, integrate, and provide information based on the knowledge. As added by Irnanda et al. and Kurniawati et al., in the educational context, digital literacy can be utilized as digital media by teachers and students in the teaching and learning process (Irnanda et al, 2022; Kurniawati et al, 2018). By having good digital literacy, teachers and students can utilize digital media in order to ease the teaching and learning process.

A number of research regarding online learning, which is indicated by Covid-19 that hit all over the world, provides different color in the teaching and learning process at the university level. In a similar line to Alamayrah et al (2022), students have skills to follow up online learning through E-Learning and other

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educational platforms. Still, online learning will make students learn individually and have less interaction with the lecturer. In contrast to Mane et al. statement (Mane et al, 2021), students had a learning experience and the lecturer obtained teaching experience in which the survey result indicates students and the lecturer had significant teaching and learning experience. Another difference can be seen from the previous research results. Nevertheless, this paper provides a description of the online learning influence on students' digital literacy skills at the university level. Almost 99% of students at university have android and smartphones as a tool for getting information. Even though a number of research have been conducted regarding digital literacy and online learning, the research in this paper is more focused on the influence of online learning on digital literacy skills as a reading source in finding out literature on learning. Digital literacy for students is not only able to apply some features developed by Android but how they can understand digital information. This skill is also called reading literacy in order to utilize digital as a learning source.

In terms of definition and purpose, digital literacy is students' skill to comprehend reading material and information described in the discourse (Kurniaman et al, 2022). Digital literacy is one of the literacies from various advanced literacy that appeared in technological development and advances (Dewi et al, 2021). According to Safitri & Marsidin (2020), one's proficiency refers to the understanding of digital content. Regarding literacy comprehension, most people believe that it is only a skill to read and write. In the early literacy progress, literacy is interpreted as the acquisition to use of language and various videos to read, write, listen, speak, look, express, and reflect on ideas critically. Further progress indicates that literacy refers to the situation and social implementation. Literacy is practical to use in social, historical, and cultural contexts in order to create and interpret the meaning within a text. In literacy, unspoken sensibility regarding the relationship between textual convention are needed. Since sensitivity to meaning or purpose, literacy is a dynamic-unstatic-varied characteristic among and within a community and discourse culture. As added by Katoningsih (2019), in literacy, people should have cognitive skills, written and spoken language acquisition, proficiency in the genre, and cultural knowledge.

Pertaining to literacy digital on university students' digital literacy skills, the use of technology through literacy digital for students is a need and must. It encourages students to be smart to use technology in learning activities (Krumsyik, 2014; Gudmundsdottir et al, 2014). As stated by Razak et al (2022), university students should be literate about technological advances by having digital literacy skills in the revolution 4.0 and should create learning comprehensively by searching for literature learning resources. Accordingly, literacy digital is crucial for students in order to provide information to anyone who needs it as literature. In Indonesia, digital literacy has been implemented. It should be implemented earlier because it is a main aspect to create intelligent and cultured nations. Listanto and Firmansyah (2022) state that the rise of the nations begins with a reading book as information and literacy understanding. It means that literacy mastery is crucial for the young generation to build a country. In a similar line to this statement, Priasti & Suyatno (2021) add that reading literacy is crucial for self-development, personal branding, professional development, school, and national development. This skill produces social habits like using Facebook, Instagram, Blogging, or other platforms. Hence, it needs skills for reading and writing to access and comprehend a discourse (Lankshear & Knobel, 2015). Consequently, Covid-19 affects university students' development in applying digital literacy to collect any information and news, which need filters and sort them all, so as not to be provoked by irresponsible authors. Thus, being intelligent in applying literacy and its influence on university students' skills can be examined by conducting factual research in order to describe the big influence of online learning on students' digital literacy skills at the university level and to describe whether the significant influence on university students' digital literacy skills is found or not.

METHOD

This paper focuses on a qualitative approach with a survey method and test analysis of university students' digital literacy skills at the two top Universities of Pekanbaru, which have an Elementary School Teacher Education Study Program. It is because both universities have Elementary School Teacher Study

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Programs. On the contrary, other universities in Pekanbaru do not have similar study programs yet. The sampling technique uses stratified random sampling with the number of 180 students from three classes. Data collection uses a questionnaire that has been tested the reliability and validity previously. The first variable is that online learning influences students' daily learning activities and the second variable is that students' digital literacy is applied as a learning resource in comprehending digital discourse. Data are currently obtained as an impact of the pandemic that changes mindsets and perspectives in digitalization by distributing the questionnaire through Google Forms and digital literacy tests with 5 essays, which distribute to students by opening a book and the use of Smartphones as a device, to search for literature the students needed to link it in the references. Data are collected and analyzed through descriptive statistics and simple linear regression analysis tests. To ease the analysis and tabulation, the researcher uses SPSS version 25.

RESULTS AND DISCUSSION

Before testing data tabulation with simple linear regression analysis through SPSS version 25, data should be first preconcerted as qualified based on the simple linear regression model through normality, linearity testing, and heteroscedasticity testing. Meanwhile, auto-correlation testing is not necessary because the research is not categorized as data time series. Clearly, the research results from both Universities in Pekanbaru can be described as follows:

Table 1. Coefficients for Class A of University A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	43.903	24.588		1.786	.085
	Online Learning	.474	.406	.216	1.168	.253

a. Dependent Variable: Digital Literacy

As concerns to the table above, the constant value from Unstandardized Coefficients indicates 43.903. It means that there is no influence of online learning positively on university students' digital literacy skills at 0.474, which means that with every 1% increase in online learning influence, it gives no influence positively. Based on the coefficient table simple linear regression, the t-count at 1,168 is lower than the t-table at 2,048. Hence, Ho is accepted, and Ha is rejected, which means that there is no influence of online learning on students' digital literacy skills. Hereafter, the coefficient table description for Class B of University A can be shown as follows:

Table 2. Coefficients for Class B of University A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	-14.167	22.854		-.620	.540
	Online Learning	1.371	.393	.550	3.489	.002

a. Dependent Variable: Digital Literacy

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Pertaining to the coefficient table above, the constant value from Unstandardized Coefficients is -14.167. It indicates that there is an influence of online learning negatively on university students' digital literacy skills, which means that the constant value of digital literacy skills is 14.167. The influence of online learning increases by 1% at 1.371 because of the negative constant value, which means that the influence of online learning refers to negative. In addition, it is seen from the coefficient table of simple linear regression that the t-count at 3,489 is higher than the t-table at 2,048. Thus, Ho is rejected, and Ha is accepted, which indicates that there is an influence of online learning on university students' digital literacy. Furthermore, the coefficient table for Class C of University A can be described as follows:

Table 3. Coefficients for Class C of University A

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	25.997	18.064		1.439	.161
	Online Learning	.775	.303	.435	2.559	.016

a. Dependent Variable: Digital Literacy

As seen from the coefficient table above, the constant value for Unstandardized Coefficients indicates 25.997. It implies that there is an influence of online learning on digital literacy skills at 25.997. The influence of online learning increases by 1% at 0.775 because of the positive constant value, which means that the influence of Covid-19 tends to be positive. Regarding the coefficient table of simple linear regression, it implies that the t-count at 2,559 is higher than the t-table at 2,048. Thence, Ho is rejected, and Ha is accepted, which implies that there is an influence of online learning on students' digital literacy. Subsequently, the coefficient table for University B related to the influence of online learning can be described as follows:

Table 4. Coefficients for Class A of University B

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	-12.544	17.194		-.730	.472
	Online Learning	1.097	.308	.559	3.567	.001

a. Dependent Variable: Digital Literacy

The constant value from Unstandardized Coefficients, obviously, indicates -12.544. It represents that there is a negative influence of online learning on university students' digital literacy skills at 1.097, which increases by 1%. If online learning implementation is applied longer, it can influence university students negatively. Aside from that, the coefficient table of simple linear regression implies that the t-count at 3.567 is higher than the t-table at 2.048. Therefore, Ho is rejected, and Ha is accepted, which represents that there is an influence of online learning on university students' digital literacy.

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Table 5. Coefficients for Class B of University B

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	-26.151	20.709		-1.263	.217
	Online Learning	1.236	.366	.538	3.377	.002

a. Dependent Variable: Digital Literacy

The constant value from Unstandardized Coefficients for Class B of University B described above indicates -26.151. It pinpoints that there is a negative influence of online learning on university students' digital literacy skills at 1.236, which increases by 1%. Related to the coefficient table of simple linear regression, the t-count value is 3,377 higher than the t-table value of 2,048. Hence, Ho is rejected, and Ha is accepted, which implies that the influence of online learning on university students' digital literacy is found.

Table 6. Coefficients for Class C of University B

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	22.481	15.792		1.424	.166
	Online Learning	.433	.277	.283	1.560	.130

a. Dependent Variable: Digital Literacy

Concerning the constant table from Unstandardized Coefficients for Class B of University B seen above, the coefficient value is 22.481. It signifies that there is a negative influence of online learning on university students' digital literacy skills at 0.433, which increases by 1% and there is no significant influence. As regards the coefficient table of simple linear regression, the t-count value is 1,560 lower than the t-table value of 2,048. Thus, Ho is accepted, and Ha is rejected, which means that there is no influence of online learning on university students' digital literacy skills. Additionally, data are concluded to see how much influence online or offline learning has on students' digital literacy. For a detailed description, it can be seen as follows:

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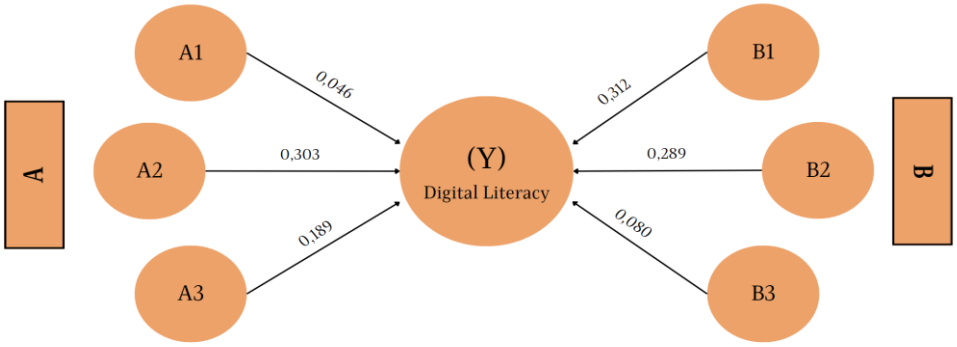

Figure 1. Conceptual Framework

As regards the figure description above, R Square value for Class A1 at University A is 0,046. It implies that the influence of online learning on students' digital literacy (Y) is 04,6%, while 95,4% is indicated by another unresearched variable. R Square value for Class A2 is 0,303, which indicates that the influence of online learning on students' digital literacy (Y) is 30,3%, while 69,7% is indicated by another unresearched variable. R Square value for Class A3 is 0,189, which implies that the influence of online learning on digital literacy (Y) is 18,9%, while 81,1% is indicated by another unknown variable.

Hereinafter, R Square value for Class B1 at University B is 0,312. It means that the influence of online learning on students' digital literacy (Y) is 31,2%, while 68,8% is influenced by another unresearched variable. R Square for Class B2 is 0,289, which implies that the influence of online learning on students' digital literacy (Y) is 28,9%, while 71,7% is influenced by another unresearched variable. R Square value for Class B3 is 0,080, which means that the influence of online learning on students' digital literacy (Y) is 08,0%, while 92% is influenced by another unknown variable.

Discussion

Online learning is intended to overcome the solution of learning problems during the Covid-19 pandemic and to apply different learning experiences. As stated by Sahrina et al (2022), the implementation of learning innovation is rapidly developed. It is seen in various online learning media like video, youtube, and many other platforms that have been used are found. It is because of the limitation that causes the lecturer and students cannot make face-to-face teaching and learning activities and interaction directly. Lestari & Nugraheti (2022) state that University student uses technology to access literature, which is related to the courses to finish the assignment given by the lecturer, either in the form of problem-solving or cases. Hence, based on the research result regarding the influence of online learning, it is seen at Class A of University A and Class C of University B did not significantly influence the university students' digital literacy skills. As stated by Kebritchi et al. in their research result (Kebritchi et al (2017), a number of university students are interested in online learning implementation because it eases students to search the literature and eases students learning at home without going to campus. In addition, Eltahir et al (2023) add that based on their research result University side can provide unlimited internet quota for students, free wifi or free internet network around the campus area, and free learning platforms for the lecturers. Subsequently, according to Garrison (2011), in the middle of the 1990s, advances in educational technology and the significant interest in asynchronous discussion group systems produce the term e-learning, which describes learning contextually by online and blended (online and face-to-face learning) for students.

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The influence of online learning on university students' digital literacy skills is seen from the data result on the coefficient table for Class B and C of University A, while the significant influence is seen from the data on the coefficient table for Class A and B of University B. Based on the four classes, the significant difference is seen from sample answer on the questionnaire item they used. In addition, to obtain data on digital literacy skills, the test was used to be analyzed and scored so that the data of Class A and B at University B indicates a negative influence. Hence, if online learning is implemented continuously, students' digital literacy skills will be disappeared. By implementing online learning in the class, as added by Mahmood et al (2023), students are challenged and limited to use and find out information because they have old Smartphones, which makes them difficult to access and browse the literature and information they look for. Furthermore, the advance in technology through the use of laptops also frequently influenced students' interest in online learning. Thereafter, low internet access, poor internet quality by using computers for a higher educational institution, poor electrical availability, and low Information and Technology, either for lecturers or students. Information and Communication Technology as infrastructure for most Universities are not determined. As suggested by Mutegi (2020), the availability of Information and Communication Technology needed as infrastructure is crucial for successful online learning. Nurtanto et al (2021) state that Information and Communication Technology is a main part of educational development in the university around the world, which is controversial because of the impact on learning. It does not only produce a positive influence but also a negative influence that we should be concerned with. Hence, this paper describes the influence of online learning, which has been habitual and cultural aspects.

Hereafter, data on the coefficient table for Class C of University A and Class B of University B produce positive influences. On this occasion, the students have distributed a treatment in online learning that tends to be positive on their digital literacy skills used to find out literature resources. As stated by A-Taai et al (2023), students can use technology to adapt themselves to new learning patterns based on technology so that every student can change their daily life behavior individually. It is because every student has a different learning style and skills. Hence, as added by Ferawati et al (2022), lecturers cannot often follow up and overcome the problem of that student's learning style difference. Learning implementation and assignment systems should be varied. Notwithstanding the influence of online learning is only a fair enough category better than the influence of another variable, it should be comprehended by lecturers and educational experts in implementing online learning. In fact, other factors are more dominant the influence on university students' digital literacy skills.

CONCLUSIONS AND RECOMMENDATION

Online learning on the student's digital literacy skills at the university level indicates positive and negative influences for students. Still, there are two classes that have no significant influence. Based on the influence of online learning applied to six classes, four classes have influence. The level of online learning influence is a fair enough category. In fact, the big influence comes from another variable that should be concerned with lecturers and educational experts. Hence, applying the appropriate online learning method should be based on the student's skill and Information and Communication Technology mastery level in looking for the literature or comprehending the literature content.

REFERENCES

Alamayrah, M. I., Jaber, J. O., Bashir, A., & Othman, A. M., Mansour, I. M., Dalabieh, A., & Al-Aboshi, A. (2022). E-Learning in faculties of engineering during COVID-19 pandemic in Jordan. *Journal of Engineering Education Transformations, 36*(2), 67-78. DOI: 10.16920/jeet/2022/v36i2/22155.

Al-Taai, S. H. H., Kanber, H, A., & Al-Dulaimi, W. A. M. (2023). The Importance of Using the Internet of Things in Education. *iJET, 18*(01), 19-39. DOI: https://doi.org/10.3991/ijet.v18i01.35999.

Dewi, D. A., Hamid, S. I., Farah Annisa, F., Octafianti, M., & Genika, P. R. (2021). Menumbuhkan Karakter Siswa melalui Pemanfaatan Literasi Digital. *Jurnalbasicedu*, *5*(6), 5249 – 5257.

Eltahir, M. E., Alsalhi, N. R., Torrisi-Steele, G., & Al-Qatawneh, S. S. (2023). The Implementation of Online Learning in Conventional Higher Education Institutions During the Spread of COVID-19: A Comparative Study. iJET, 18(01), 68-99. DOI: https://doi.org/10.3991/ijet.v18i01.36005.

Ferawati, Y, E., Murjaninah., & Syaflin, S, L. (2022). Pengembangan Multimedia Berbasis Web Muatan IPA Siswa Kelas V Di Sekolah Dasar. *Primary: Jurnal Pendidikan Guru Sekolah Dasar, 11* (6), 1645-1658. DOI: http://dx.doi.org/10.33578/jpfkip.v11i6.9241.

Garad, A., Al-Ansi, A. M., & Qamari, I. N. (2021). The Role of E-Learning Infrastructure and Cognitive Competence in Distance Learning Effectiveness during the Covid-19 Pandemic. *Cakrawala Pendidikan, 40*(1). https://doi.org/10.21831/cp.v40i1.33474.

Gudmundsdottir, G. B., Loftsgarden, M., & Ottestad, G. (2014). Nyutdannede lærere: Profesjonsfaglig digital kompetanse og erfaringer med IKT i lærerutdanningen. Senter for IKT i Utdanningen.

Garrison, D. R. (2011). E-Learning in the 21st Century: A Framework for Research and Practice. Routledge. https://doi.org/10.4324/9780203838761.

Irnanda, E., Kurniaman, O., & Mulyani, E. A. (2022). Pengembangan Blog Literasi Membaca untuk Meningkatkan Literasi Membaca Siswa Sekolah Dasar. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6*(5), 5091-5102. DOI: 10.31004/obsesi.v6i5.2806.

Kurniaman, O., Firdaus, L. N., Hadriana, Sumarno. (2022). The Use Of Technology In Learning To Read: A Literature Review. *Primary: Jurnal Pendidikan Guru Sekolah Dasar, 11* (5), 1407-1419. DOI: http://dx.doi.org/10.33578/jpfkip.v11i5.9047.

Kurniaman, O., Mulyani, E. A., Noviana, E., Sari, I. K., Permana, D., Irnanda, E., & Nanda, D. W. (2022). Development of Study Room Blog in Learning Reading Literacy in Elementary School. *Al-Ishlah: Jurnal Pendidikan, 14*, (2), 1815-1826. DOI: 10.35445/alishlah.v14i1.1896.

Kurniawati, N., Maolida, E. H., & Anjaniputra, A. G. (2018). The praxis of digital literacy in the EFL classroom: Digital-immigrant vs digital-native teacher. *Indonesian Journal of Applied Linguistics, 8*(1), 28-37. https://doi.org/10.17509/ijal.v8i1.11459.

Khamparia, A., & Pandey, B. (2017). Impact of Interactive Multimedia in E-Learning Technologies: Role of Multimedia in E-Learning. Enhancing Academic Research with Knowledge Management Principles, April, 199–227. https://doi.org/10.4018/978-1-5225-2489-2.ch007.

Katoningsih, S. (2019). Pengembangan Model Manajemen Pelatihan Literasi Membaca Berorientasi Pisa Berbasis Mobile Learning Untuk Guru Bahasa Inggris Di Kota Semarang. *Disertasi tidak dipublikasikan*. Semarang: Universitas Negeri Semarang.

Krumsvik, R. J. (2014). Teacher educators' digital competence. Scandinavian Journal of Educational Research, 58(3), 269–280.

Kebritchi, M., Lipschuetz, A., and Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. Journal of Educational Technology Systems, 46(1), 4–29. https://doi.org/10.1177/0047239516661713.

Listanto, V., & Firmansyah, N. (2022). The Trend of Library Development in Indonesia and the Effects on Literacy Skills in Schools. Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 8(3), 508-520. doi:https://doi.org/10.33394/jk.v8i3.5643.

Lankshear, C., & Knobel, M. (2015). Digital literacy and digital literacies: Policy, pedagogy, and research considerations for education. *Nordic Journal of Digital Literacy, 9*, 8–20.

Lestari, T., & SB. Nugraheti, S.,(2022). Game Media Development Cross Puzzles in Learning Summary Explanation Text. *EduGen: Educational Generation Journal, 1*(1), 1-8. DOI : https://doi.org/10.56787/edugen.v1i1.3.

Mutegi, R. (2020). ICT Inequalities And E-Learning In The Wake Of Covid-19 In Kenya. *International Interdisciplinary Journal of Education, 9*(4), 220. DOI: https://doi.org/10.36752/1764-009-004-015.

Mahmood, I. N., & Abuzaraida, M. A. (2023). A Proposed Model for E-learning Adaptability Measurement During COVID-19 Pandemic Using Data Mining Techniques. *International Journal of Interactive Mobile Technologies (iJIM), 17*(01), 74-95. DOI: https://doi.org/10.3991/ijim.v17i01.35731.

Mane, S. U., Patil, S. R., & Kulkarni, S. S. (2021). Online Teaching-Learning xperience During E COVID-19 Pandemic – A Case Report. *Journal of Engineering Education Transformations, 35* (2), 114-119.

Nurtanto, M., Sofyan, H., & Pardjono, P. (2021). E-Learning Based AutoCAD 3D Interactive Multimedia on Vocational Education (VE) Learning. *Journal of Engineering Education Transformations, 36* (2), 67-78.

Priasti, S. N., & Suyatno, S. (2021). Penerapan Pendidikan Karakter Gemar Membaca Melalui Program Literasi di Sekolah Dasar. Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, *Pengajaran Dan Pembelajaran, 7*(2), 395. https://doi.org/10.33394/jk.v7i2.3211.

Razak, H. M., Razak, N. A., & Krish, P. (2022). Enhancing students' digital literacy at EFL classroom: Strategies of teachers and school administrators. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan, 41*(3). 653-664. https://doi.org/10.21831/cp.v41i3.43107.

Safitri, I., & Marsidin, S. (2020). Analisis Kebijakan Terkait Kebijakan Literasi Digital Di Sekolah Dasar. *Core.Ac.Uk, 2*(2), 176–180. Https://Doi.Org/10.31004/Edukatif.V2i2.123

Syaharuddin, S., Mutiani, M., Handy, M. R. N., Abbas, E. W., & Jumriani, J. (2021). Building Students' Learning Experience in Online Learning During Pandemic. *Al-Ishlah: Jurnal Pendidikan, 13* (2), 979-987.

Syauqi, K., Munadi, S., & Triyono, M. B. (2020). Students' Perceptions toward Vocational Education on Online Learning During the Covid-19 Pandemic. *International Journal of Evaluation and Research in Education (IJERE), 9*(4), 881. https://doi.org/10.11591/ijere.v9i4.20766.

Sahrina, A., Sumarmi, S., Purwanto, P., Rosyida, F., Shafie, A. B., Prasetyono, D., Suprianto, A., Fadlan, M. S., & Labib, M. A. (2022). The Use of Smartphones in Geography Learning: A 21st Century Learning Innovation in Identifying Nature Appearances Based on Fieldwork. *International Journal of Interactive Mobile Technologies (iJIM), 16*(22), 15-31. DOI: https://doi.org/10.3991/ijim.v16i22.36151.

Wijaya, H., Supartini, T., Sumule, L., Weismann, I. T. J., & Tari, E. (2021). Online Learning Evaluation in Higher Education: Study Survey Method. *Journal of Education Technology, 5*(3), 401-408. DOI: http://dx.doi.org/10.23887/jet.v5i 3.35466.

Zhang, Y., Ghandour, A., & Shestak, V. (2020). Using Learning Analytics to Predict Students Performance in Moodle LMS. *International Journal of Emerging Technologies in Learning, 15*(20), 1-20. https://doi.org/10.3991/ijet.v15i20.15915.