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The Effectiveness of Using Assemblr Edu Learning Media to Help Student Learning at School

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Abstract: Assemblr Edu is an application that provides interactive 3D augmented reality-based learning media for students. research was conducted on the effectiveness of the application as a learning medium for teaching and learning activities of the Assemblr Edu application. In the application, various learning topics are presented that can be studied by students from elementary to high school levelsThis research uses a descriptive quantitative research method by utilizing google Forms in disturbing questionnaires in form of questionnaires. The result of the research is: The Assemblr Edu learning application can be a more interesting and modern learning solution to be applied in schools; The use of the Assemblr Edu application which is quite easy can provide opportunities for more effective learning with the features of learning topics that are already complete enough to be learned; the lack of knowledge of students about Augmented Reality technology has an impact on the Assemblr Edu application that is rarely used by schools or students independently; and support from hardware such as smartphones is very important with specifications that are large enough in terms of memory storage, to run applications better and efficiently and connection stability also affects the use of this learning application.

Keywords: Application; Assemblr Edu Media School; Student Learning.

Introduction

The rapid development of the industrial revolution 4.0 cannot be avoided by anyone, so the human resources are needed to be able to compete globally. Increasing of human resource quality can be done at educational institutions (Lase, 2019; Majid, 2020; Sumiyati, et al., 2020). One of the formal institutions that oversees the educational and development of children is a school institution. The importance of teacher in giving lessons can affect to student learning interest, because not a few of students who ignore the lessons from the teachers as a result of the monotonous, boring and useless lessons (Alpian et al., 2019). To face the era of industrial revolution 4.0, educational is needed that can form student to be creative, innovative, and competitive in competing. This can be achieved by using technology that is rapidly developing at the present time (Lase, 2019; Majid & Sudira, 2017; Putri et al., 2019). Tondeur et al (2011) stated that digital technology has begun to be used in the field of education as tools and facilities that can support learning in school (Danisworo, 2019; Zuhdi et al., 2021).

One form of using technology in learning activities is in interactive learning media. By taking advantage of technological developments, teachers can make learning more interesting such as using e-learning, powerpoint,

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and other which can be made by the teacher himself (Gulo, 2021). Some of the learning media are presented online in service or smartphone applications, such as Zoom, Google Classroom, Animaker, Assemebler Edu, etc. Base on those, many researchers have raised the theme of the effectiveness of using these learning media applications and services. Such as: The Effectiveness of Online Learning Media through Google Classroom (Syakur et al., 2020). The Effectiveness of Using the Zoom Application as an Online Learning Media for Students During the Covid-19 Pandemic (Syakur et al., 2020; Gulo, 2021; Danisworo, 2019), The Effectiveness of Animaker-Based Animated Videos on Students' Clean and Healthy Life Behavior Elementary School (Burhanuddin et al., 2018; Herlandy et al., 2020; Hikmawan et al., 2018; Pranata et al., 2022). From the many research obtained, rarely found research that discusses the effectiveness of assembler edu applications, so it needs to be done. Assembler Edu is an augmented reality application that is specifically made to help needs in the world of education, especially in the teaching and learning process. Assembler Edu hopes to be able to provide a more interesting and enjoyable learning and teaching experience. This application is based on augmented reality so that it has more interactive learning for students. The purpose of this research was to know the effectiveness of using Assemblr Edu learning media in supporting learning at schools. This research is expected to be useful in giving additional information about the effectiveness of using the Assembler Edu application for teachers and students at Junior and High School.

Teaching and learning is a process where there is a communication between educators and students, so the media used in the teaching and learning process is commonly called learning media (Majid et al., 2021; Majid, 2020; Fuada, et al., 2020). In learning and teaching process, a learning media is needed to carry out a communication in the classroom so that learning runs optimally (Hendawati et al., 2019; Putri et al., 2021). Therefore, teaching and learning process in schools cannot be separated from the important role of learning media that can make it easier for students to understand and absorb any given material [13]. Learning process goes well and not well because of the influence of the learning media used by teaching staff. Teaching and learning process can be called effective and efficient if it is carried out with the help of technology, from which an educator is required to master technology.

Literally the meaning of the media when connected with "learning media" is an intermediary or introduction (Masykur et al., 2017). The other mean of learning media is all things in the form of communication tools that can be used as a tool in giving information from teachers to students in a planned way, so as to create a conducive learning environment where students can learn more effectively and efficiently (Mistrik et al., 2016). Three-dimensional media itself can be interpreted as media with a view that can be observed in its overall shape from various angles or directions. This three-dimensional media has the criteria of volume, length, width and height. Some media that are included in three-dimensional media are prototypes, balls, fruit, etc. From the above understanding of three-dimensional media, it can be concluded that three-dimensional learning media are media that can be observed from various directions as a whole that can be used to help giving information when learning. One of the learning media that uses three-dimensional media is 3D augmented reality media.

There are applications based on 3D augmented reality, one of them is an application called Assemblr Edu. Assemblr Edu is an augmented reality application that is specifically made to help the needs in the world of education, especially in the teaching and learning process. Inside this application, there are some features such as classes, topics, scans and profiles. This application is based on augmented reality so that it has more interactive learning for students.

Method

This research is a quantitative descriptive study using a survey method conducted by distributing a questionnaire in the form of an online google form. Quantitative research is research that emphasizes objective phenomena and is studied quantitatively, carried out using numbers that will be processed using statistical data, and descriptive research is a method that examines the form of activity aimed at describing the phenomena that exist and take place at this time or in the past based on facts with the right interpretation (Hikmawan et al., 2019; Werdiningsih et al., 2019).

The samples used in this research were randomly selected from junior/high school students in the West Java province. Primary data collection in this research was carried out by distributing a questionnaire in the form of a student opinion questionnaire on the Assemblr Edu application on March 18, 2022. it was found that there were 20 students full fill the questionnaire.

Result and Discussion

Junior and High School Student's views on the implementation of learning in schools

Learning media is one of the factors that make teaching and learning activities run effectively. For the example is, with using interesting learning media, the student can learn easily and not bored like monotonous

learning. Many learning media can we use in smartphone or services, one of them is Assemblr Edu with the concept 3D Augmented Reality. This the following display of the Assemblr Edu application.

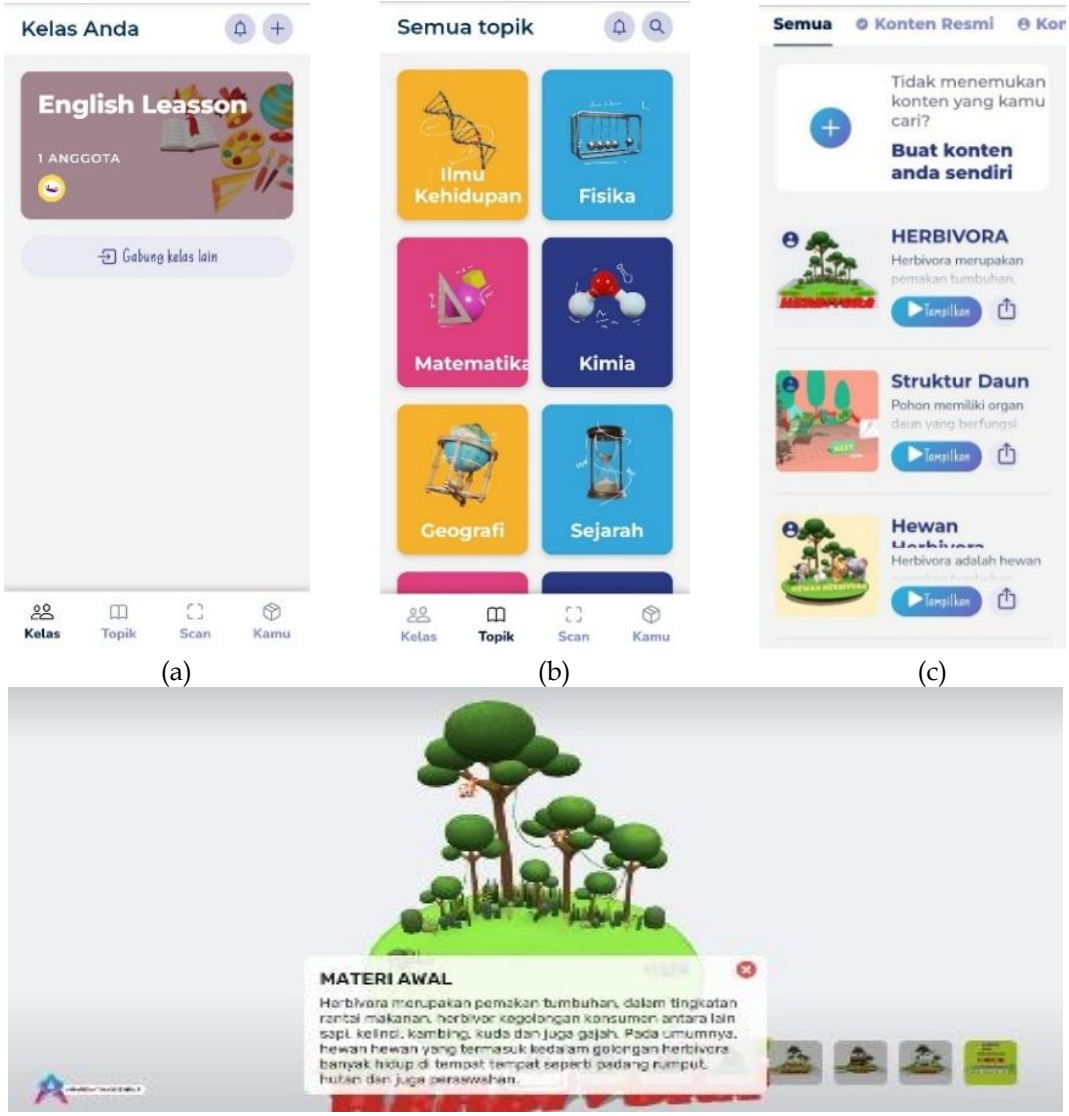

Figure 1. Assemblr edu feature display (a) Add Class Feature, (b) Topic and Materials Feature, (c) 3D AR Content List, and (d) The Content of 3D AR

Researchers conducted a survey of junior and high school students to find out how attractive the learning media at school and how likely it was that Assemblr Edu learning media could help implement teaching and learning activities in schools. The survey is in the form of a questionnaire that uses Google Forms. This was is used to comply with health protocols during the COVID-19 pandemic. From the questionnaire, we get the number of respondents obtained as many as 20 junior and high school students. Most respondents stated that learning in schools was close to very good, this was because several schools had implemented learning that was able to meet the needs of their students. Some of the respondents also thought that the learning media delivered at school was interesting and could stimulate their interest in learning. Besides that, most of the respondents do not know what augmented reality is. Other results show that learning media based on 3D augmented reality is still very rarely used and even knows it. Most respondents stated that 3D augmented reality learning media can help in the process of learning and teaching activities in their schools to meet learning deficiencies in their schools, but there are still respondents who doubt that this learning media can help meet learning deficiencies in their schools. These results have shown that 3D augmented reality learning media can be accepted by some students to support learning at school. Many of the respondents

do not like using the application because the UI design is difficult to reach and the amount of storage used. However, some respondents also said that this media was very enjoyable because the learning was presented in the form of 3-dimensional media with the person as users.

In the results of the questionnaire about whether or not this learning media was applied at schools, it was found that most students agreed to be able to use the Assembler Edu application in the teaching and learning process at school because it could increase student's interactive knowledge and creativity in using 3D media. Based on the student's opinion who becomes respondents of our survey, the Assemblr Edu application has the following advantages such as make learning and teaching activities more interesting; easy to use when learning; has an attractive display of content and helps learning; and the material presented is quite complete and in accordance with the subject category.

Behind many advantages of this application, there was still shortcomings that may have to be improved by the builders such as it cannot used by students under the age of 10; the size is quite large, so not all students can download and use this application; the UI of this application is too difficult to reach; and most of the content is used online, so it requires a stable internet speed and a fairly large internet data.

Normality test is a test with the goal of assessing the distribution of data in a group, whether the distribution of the data is normally distributed or not. The meaning of normally distributed is that the data will follow the form of a normal distribution where the data is centered on the average and median values. The hypothesis are data is normally distributed (H_o) and data is not normally distributed (H_a). By using the chi square table, the data is not normally distributed (Ha) if X count $\geq$ X table and the data is normally distributed (Ho) if X count < X table.

Q1 is "What do you think about learning at school?". From a scale of 1 – 5, respondent's data is obtained which is presented on table 1. we get the average result is 4.02 and SD 0.68. By using the alpha approach = 0.95, from the chi square table, the X^2 table value = 0.5543. Based on the results, it can be seen that X count < X table, then Q1 is accepted or normally distributed.

Q2 is "Are the learning media used in schools has been interesting?" From a scale of 1 – 5, respondent's data is obtained which is presented on table 2. We get the average result is 3.08 and SD 1.11. By using the alpha approach = 0.95, from the chi square table, the X^2 table value = 0.5543. Based on the results, it can be seen that X count > X table, then Q2 is rejected or not normally distributed.

Data Normality Test

Table 1. Q1 respondent (chi square)

Responden Q1						
Scale	F (Oi)	Zo	Za	Wide Difference	F(Ei)	X^2
1	0	-5.19	-3.72	0	0	0.000
2	0	-3.72	-2.24	0.0125	0.625	0.000
3	11	-2.24	0.77	0.2081	10.405	0.034
4	27	-0.77	0.71	0.5405	27.025	0.000
5	12	0.71	2.18	0.2243	11.215	0.055
SUM	50					0.089

Table 2. Q2 respondent (chi square)

Responden Q2						
Scale	F (Oi)	Zo	Za	wide difference	F(Ei)	X2
1	4	-2.32	-1.42	0.0676	3.38	0.114
2	11	-1.42	-0.52	0.2237	11.185	0.003
3	18	-0.52	0.38	0.3465	17.325	0.026
4	11	0.38	1.28	0.2517	12.585	0.200
5	6	1.28	2.18	0.0857	4.285	0.686
SUM	50					1.029

Table 3. Q3 respondent (chi square)

Responden Q3						
Scale	F (Oi)	Zo	Za	wide difference	F(Ei)	X2
1	0	-4.57	-3.20	0.0007	0.035	0.035
2	1	-3.20	-1.83	0.0329	1.645	0.253
3	15	-1.83	-0.47	0.2856	14.28	0.036
4	25	-0.47	0.90	0.4967	24.835	0.001
5	9	0.900	2.27	0.1725	8.625	0.016
SUM	50					0.342

Table 4. Q4 respondent (chi square)

Responden Q4						
Scale	F (Oi)	Zo	Za	Wide difference	F(Ei)	X2
1	2	-2.85	-1.72	0.0405	2.025	0.000
2	11	-1.72	-0.59	0.2339	11.695	0.041
3	23	-0.59	-0.54	0.4288	21.44	0.114
4	12	-0.54	1.68	0.2481	12.405	0.013
5	2	1.68	2.881	0.044	2.2	0.018
SUM	50					0.187

Table 5. Q5 respondent (chi square)

Responden Q5						
Scale	F (Oi)	Zo	Za	wide difference	F(Ei)	X2
1	2	-2.85	-1.72	0.0405	2.025	0.000
2	11	-1.72	-0.59	0.2339	11.695	0.041
3	23	-0.59	-0.54	0.4288	21.44	0.114
4	12	-0.54	1.68	0.2481	12.405	0.013
5	2	1.68	2.881	0.044	2.2	0.018
SUM	50					0.187

Q3 is "In your opinion, can 3D Augmented Reality learning media help the lack of learning in schools?" From a scale of 1 – 5, respondent's data is obtained which is presented on table 3. We get the average result is 3.84 and SD 0.73. By using the alpha approach = 0.95, from the chi square table, the X^2 table value = 0.5543. Based on the results, it can be seen that X count < X table, then Q2 is accepted or normally distributed.

Q4 is "How do you feel about using the Assemblr Edu application?". From a scale of 1 – 5, respondent's data is obtained which is presented on table 4. We get the average result is 3,02 and SD 0,88 By using the alpha approach = 0.95, from the chi square table, the X^2 table value = 0.5543. Based on the results, it can be seen that X count < X table, then Q2 is accepted or normally distributed.

Q5 is "Do you think Assemblr Edu is suitable for use when learning at school?" From a scale of 1 – 5, respondent's data is obtained which is presented on table 5. We get the average result is 3.02 and SD 0.88.By using the alpha approach is 0.95, from the chi square table, the $\boxed{X^2}$ table value is 0.5543. Based on the results, it can be seen that $X_{count} < X_{table}$, then Q2 is accepted or normally distributed.

Discussion

One of the factors that determine the continuity of good teaching and learning activities is the use of learning media. By using creative and interactive learning media, it can stimulate student's mindset and attract students who initially had difficulty understanding learning to become easy to understand learning. Assemblr Edu software is one of the interactive

learning media that is presented in 3 dimensions. By using this software, students can understand learning easily because it is presented in 3 dimensions.

Based on the results of research referring to the Assemblr Edu software, it was found that 4 hypotheses were accepted and 1 hypothesis was rejected. The rejected hypothesis is a hypothesis about the use of interactive media in schools which is still lacking. Well, from the explanation above, it was found that the Assemblr Edu software can help attract student's interest and creativity, because of the 3 questions about using the software, all hypotheses were accepted.

Conclusion

From the discussion that has been described previously, we can conclude that the Assemblr Edu learning application can be a more interesting and modern learning solution to be applied in school. Then, the use of the Assemblr Edu application which is quite easy can provide opportunities for more effective learning with the features of learning topics that are already complete enough to be learned. Besides that, the lack of knowledge of students about Augmented Reality technology has an impact on the Assemblr Edu application that is rarely used by schools or students independently. Last, support from hardware such as smartphones is very important with specifications that are large enough in terms of memory storage, to run applications better and efficiently and connection stability also affects the use of this learning application.

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Author Contributions

Nuur Wachid Abdul Majid: Conceptualization, methodology, writing—original draft preparation, formal analysis, investigation, and visualization. Muhammad Rafli, Noviyanti Nurjannah, and Putri Apriyanti: data collecting, data analysis, draft manuscript, and resources. Sofyan Iskandar, Fitri Nuraeni, and Hafiziani Eka Putri: writing—review and editing, and validation. Pratama Benny Herlandy and Mohamed Nor Azhari Azman: validation, re-wreating manuscript and proofreading

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Conflicts of Interest

The authors declare no conflict of interest

References

Alpian, Y., Anggraeni, S. W., Wiharti, U., & Soleha, N. M. (2019). Pentingnya Pendidikan Bagi Manusia. *Jurnal Buana Pengabdian*, *1*(1), 66–72. https://doi.org/10.36805/jurnalbuanapengabdian.v1i1.581

Burhanuddin., Majid, N. W. A., & Hikmawan, R. (2018). Implementation of Character Education Using Islamic Studies in Elementary School Teacher Training. *4th International Conference on Teacher Training and Education (ICTTE 2018)*, 383–387. http://dx.doi.org/10.2991/ictte-18.2018.71

Danisworo, M., Cholily, Y.M., Rosyadi, A.A.P., (2019). Pengembangan Web Pembelajaran Matematika Materi Aritmatika Sosial. Prismatika: Jurnal Pendidikan dan Riset Matematika, 2 (1), 15-22. https://doi.org/10.33503/prismatika.v2i1.515

Gulo, E. (2021). Science and Technology Innovation and the Quality of Modern, Competent, and Integrity Higher Education. *Seminar Nasional Perguruang Tinggi Hukum: Berintegritas Dan Berbasis Teknologi*, 523–546. https://doi.org/10.15294/snhunnes.v7i2.736

Hendawati, Y., Pratomo, S., Suhaedah, Lestari, N. A., Ridwan, T., & Majid, N. W. A. (2019). The Impact of Approach Contextual Teaching and Learning Science to Improve Understand the Ability of Elementary School Student Concept. *Journal of Physics: Conference Series*, 1318, 1-7. https://doi.org/10.1088/1742-6596/1318/1/012130

Herlandy, P. B., Azim, F., & Majid, N. W. A. (2020). The effectiveness of Augmented Reality based Learning on Vocational Competencies of Vocational School Students. *Edumatic: Jurnal Pendidikan Informatika*, *4*(2), 120–128. https://doi.org/10.29408/edumatic.v4i2.2653

Hikmawan, R., Majid, N. W. A., & Kasmad, M. (2018). Pengembangan Model Pembelajaran IKIGAI untuk Mendukung Ketercapaian High Order Thinking Skills (HOTS). *Prosiding FKIP UMC*, *1*(1). Retrieved from https://e-journal.umc.ac.id/index.php/pro/article/view/98

Lase, D. (2019). Education and Industrial Revolution 4.0. *Jurnal Handayani*, *10*(1), 48–62. https://doi.org/https://doi.org/10.24114/jh.v10i1.14138

Majid, N. W. A., & Sudira, P. (2017). Proses perolehan kompetensi TIK melalui program praktik industri siswa SMKN 2 Pengasih Kulon Progo. *Jurnal Pendidikan Vokasi*, *7*(1), 14–29. http://dx.doi.org/10.21831/jpv.v7i1.12712

Majid, N. W. A., Abukhair, A., Alfathin, A., Ummah, A. H., & Wardani, R. (2021). Optimalisasi Pembelajaran Efektif di Rumah Saat Pandemi Covid-19 Kepada Warga Persyarikatan Muhammadiyah Kabupaten Purwakarta. *Indonesian Journal of Community Services in Engineering & Education*, *1*(1), 1–7. Retrieved from https://www.researchgate.net/profile/Nuur-Wachid-Abdul-Majid/publication/359399846_Optimalisasi_Pembelajaran_Efektif_di_Rumah_Saat_Pandemi_Covid-19_Kepada_Warga_Persyarikatan_Muhammadiyah_Kabupaten_Purwakarta/links/6239f0f23339b64f0daf705e/Optimalisasi-Pembelajaran-Efektif-di-Rumah-Saat-Pandemi-Covid-19-Kepada-Warga-Persyarikatan-Muhammadiyah-Kabupaten-Purwakarta.pdf

Majid, N. W. A., Fuada, S., Fajri, M. K., Nurtanto, M., & Akbar, R. (2020). Progress Report of Cyber Society v1.0 Development as a Learning Media for Indonesian Society to Support EFA. *International Journal of Engineering Pedagogy*, *10*(4), 133–144. https://doi.org/10.3991/ijep.v10i4.13085

Majid, N. W. A., Sumiyati, T., Putri, H. E., & Prasetio, A. P. (2020). MOOCs phenomenon and role in STEM-related education and EFA movement. *Journal of Physics: Conference Series*, *1521*(4), 042046. https://doi.org/10.1088/1742-6596/1521/4/042046

Masykur, R., Nofrizal, N., & Syazali, M. (2017). Pengembangan Media Pembelajaran Matematika dengan Macromedia Flash. *Al-Jabar : Jurnal Pendidikan Matematika*, *8*(2), 177–186. https://doi.org/10.24042/ajpm.v8i2.2014

Mistrik, I., Soley, R., Ali, N., Grundy. J., & Tekinerdogan, B. (2016). *Software Quality Assurance In Large Scale and Complex Software-Intensive Systems*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-802301-3.00001-6

Pranata, K., Lusiana Dew, H., & Zulherman, Z. (2022). Efektivitas Video Animasi Berbasis Animaker Terhadap Perilaku Hidup Bersih Dan Sehat Siswa Sekolah Dasar. *Journal Tunas Bangsa*, *9*(1), 11–17.

Putri, H. E., Sasqia, A. S., Abdulloh, A., Fuada, S., Muqodas, I., & Majid, N. W. A. (2021). Correlation between mathematic learning outcomes and self-regulated learning in the covid-19 pandemic situation. *Journal of Physics: Conference Series*, *1987*(012025).

Putri, H., Isrokatun, I., Majid, N., & Ridwan, T. (2019). Spatial Sense Instrument for Prospective Elementary School Student. *Journal of Physics: Conference Series*, *1318*(1), 1–6. https://doi.org/10.1088/1742-6596/1318/1/012142

Syakur, A., Sugirin., & Widiarni. (2020). The Effectiveness of English Learning Media through Google Classroom in Higher Education. *Britain International of Linguistics Arts and Education (BIoLAE) Journal*, *2*(1), 475–483. https://doi.org/10.33258/biolae.v2i1.218

Tondeur, J., Brakk, J.V., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2011). Preparing Pre-Service Teachers to Integrate Technology in Education: A Synthesis of Qualitative Evidence. Computer & Education, 59 (1), 1-11. http://dx.doi.org/10.1016/j.compedu.2011.10.009

Werdiningsih, T., Triyono, M. B., & Majid, N. W. A. (2019). Interactive Multimedia Learning based on Mobile Learning for Computer Assembling Subject using the Principle of Multimedia Learning (Mayer). *International Journal of Advanced Science and Technology*, *28*(16), 711–719. Retrieved from https://www.researchgate.net/publication/342158818_Interactive_Multimedia_Learning_based_on_Mobile_Learning_for_Computer_Assembling_Subject_using_the_Principle_of_Multimedia_Learning_Mayer

Zuhdi, A., Firman, F., & Ahmad, R. (2021). The importance of education for humans. *SCHOULID: Indonesian Journal of School Counseling*, *6*(1), 22. https://doi.org/10.23916/08742011