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Children's Handicaps in Online Learning: A Highlight on Learning Applications

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ABSTRACT

This current study aims to document the challenges encountered by children in adapting to the learning applications in online learning. A literature study is used to answer the research question. The data was obtained from a systematic search in the Google scholar. From the search, 15 articles from 2010 – 2021 were gathered as the research data. To analyse the data, a content analysis was implemented. The findings revealed that the children met the difficulties because they tend to have short concentration span and get bored easily, the limitation of learning device, and signal stability. Moreover, less parents' control causes young learners disoriented while using the applications. Surprisingly, the students did not face hindrance in relation to the applications use. Most of them adapted quite easily in using the applications. This implies that children nowadays are very adaptive towards technology and are easier to learn through diverse platforms in online learning. Limitations and future recommendations are also presented.

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1. INTRODUCTION

Online learning is a learning environment that can be used as a setting for the teaching and learning process that is carried out without meeting face-to-face between teachers and students (Moore et al., 2011). Currently, the trend of online learning is getting more popular because of the pandemic issue. More and more teachers use technology to support the learning activities. In line with this, Maskar et al. (2020) state that along with the times, one can obtain information directly and easily through new technologies that are constantly evolving. The development of this technology can be beneficial in the field of education for both teachers and students. The benefits can be obtained by teachers who teach in all levels of education, from elementary to university across the subjects, from language to mathematics. Using online learning is believed to provide shorter learning time and more practical learning tools (Lapitan Jr et al., 2021). Thus, it can make lesson costs more economical. Online learning can also facilitate students' interaction with the material that has been provided. Students can

share information and access learning materials over and over again, and this can be a process of developing knowledge not only in the classroom, but also outside the classroom or at home. With the help of technological equipment and internet networks, students can be actively involved in the teaching-learning process (Rohmah, 2016). In short, online learning has given some positive benefits in some ways.

Despite the benefits of online learning, this sort of learning mode has also provided many shortcomings, including the lack of interaction between teachers and students. This lack of interaction can slow down the formation of judgment and reasoning in delivering lessons in the teaching and learning process (Ali & Magalhaes, 2008). There might also be a tendency to ignore academic and social aspects (Bhatt & MacKenzie, 2019). The learning and teaching process is more towards training than education and the majority of students do not have the motivation to learn in online learning (Yazdi, 2012). The difficulties that often occur through self-concept or self-ability when students learn at home are 1) students cannot have their own learning initiative, so students wait for instructions or assignments from the teacher in learning, 2) students are not accustomed to carrying out online learning needs at home, students learn the materials according to what is given by the teacher, not what they need, 3) the goals or targets of students' online learning still limited to obtaining satisfactory grades, not the abilities they should improve, 4) some students are still unable to monitor, regulate, and control online learning at home, still seem to learn as necessary, 5) there are still students who give up doing the online learning assignments when there are difficulties and mistakes mostly made by them and students who rarely evaluate the process of their learning outcomes (Utami & Cahyono, 2020). Therefore, this online learning situation becomes very challenging not only for teachers but also for learners especially at the elementary school level.

In the online learning practice, the use of learning applications is unbearable. These learning tools support the teacher and students achieve the learning goals and it was reported in many studies done by previous researchers. For example, a study conducted by Mulyono (2016) conveyed that the use of Quipper as an online learning application for English teaching was affordable because it corresponded to the three conditions of CALL pedagogy. Therefore, it has become a potential instrument for teaching and learning foreign languages online. Another study was conducted by Aljojo et al. (2020). They described the teaching and learning Geography for children between 9 – 12 years old by developing an application, namely Kids' Atlas. Kids' Atlas is an Android app designed to assist youngsters in learning and testing their knowledge. The program enhances learning through entertainment by incorporating technologies that assist children in studying geography by captivating their attention and allowing them to interact more effectively than traditional methods of teaching by visualizing 3D objects. This phenomenon informed us that educators are recently more aware of the importance of using learning applications in teaching young learners. Besides the two presented examples, many researchers have discovered the use of learning applications for young children in different lessons (Afif & Dwijayanto, 2020; MacEachren et al., 2002; Nikolova & Georgiev, 2021; Vasudevan et al., 2019). All in all, these applications are proven to give positive contributions on the effectiveness of online learning for children.

From the previous literature mentioned, the readers were informed of two kinds of online learning environment, namely synchronous and asynchronous (Cleveland-Innes & Ally, 2004). Synchronous online learning is conducted when teachers and students have direct interaction, while asynchronous online learning is when the interaction is not direct or live. Guo (2020) mentioned that children who participate in synchronous online learning get more understanding than those who do not. The studies above mentioned that even in those two online learning environments, the applications have still presented helpful roles for students and teachers. However, there was missing information that is not revealed specifically. It was the challenges met by students during operating those applications. Therefore, this recent study has a purpose for investigating that problem. The researcher is trying to discover what students' difficulties are when using learning applications during online learning. This is conducted because we have to put an attention on the effectiveness of the learning by viewing it from

students' perspectives. It is hoped that after gaining information about the children's handicaps in using learning applications, teachers will be more attentive to find better solutions in achieving learning goals. Moreover, parents are also expected to pay more attention to their children when doing online learning.

2. METHODS

2.1. Literature search

In order to get a comprehensive understanding on the children's handicaps when using applications in online learning, a computerised literature search was conducted. The main data was gained from the largest online article database, Google Scholar. First, the search was done to find out studies that specifically discussed online applications for kids. Second, the search was specific to the challenges, difficulties, constraints, and barriers they encounter. Two main key terms were utilized to do the search namely 'synchronous' and 'asynchronous' (Cleveland-Innes & Ally, 2004). More specifically, the key terms were expanded as the combined items of: 'online learning', 'children', 'barrier(s)', 'online application', 'learning application', 'young learners', 'elementary school', 'kids', 'handicap(s)', 'challenge(s)', 'school', 'learning at home', 'pandemic', and 'classroom'. In addition, a snowballing strategy was utilized to locate further relevant studies by reviewing all of the reference lists of the selected publications.

2.2. Literature selection

In the beginning of the step, the selection criteria were too broad. The key words used appeared anywhere in all detected articles in the Google Scholar. The first results of the search contained 15 pages of the slides as a combination of international and national journals. A page had ten articles, so there were 150 articles that were sorted in a large search. Moreover, after the specific criteria were applied, from those numbers of articles, 15 of them were sorted as the research data. The sortation was done based on the two main categories, synchronous and asynchronous online platforms that the teachers and students used.

2.3. Analysis of the Literature

To describe the students' difficulties in online learning throughout the two major terms (synchronous and asynchronous online learning), the analysis procedure of Harwood & Garry (2003) for content analysis studies were followed. It includes a classification scheme based on specific research questions identified through a survey of the literature (Carson et al. 2001). This allows for the identification of data units, which are then classified, documented, compared, and contrasted in order to arrive at a conclusion regarding the communication's content (Harris 1996; Collis and Hussey 2003). Contextually, the researcher identified the selected articles and classified them based on two main categories; synchronous and asynchronous. After that, a comparison was done to distinguish the challenges in the application use. Finally, a conclusion was drawn to portray the big picture of the frequent handicaps experienced.

3. FINDINGS AND DISCUSSION

The data used in this study provided information about the major hindrance of the children in utilizing the applications in learning at home during the pandemic. The common challenges comprise three layers, namely personal state which comes from the children fundamental character, control from environment which involves parents, teachers, and adults around them, and network facilities that are still low quality. Those three aspects are illustrated in the figure below.

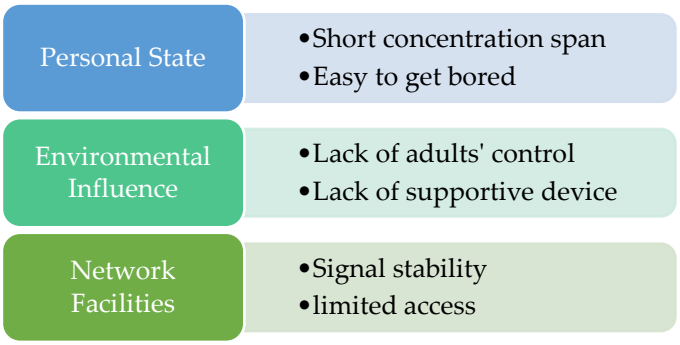

Figure 1. Common Challenges of Young Learners in Using Learning Applications

From Figure 1, it can be seen that there are three issues appearing in the use of applications by young learners. The difficulties they encountered are caused by the children's basic characteristics, namely having a short concentration span. According to Lelawati (2019), young learners have their own characteristics that distinguish them from adult learners. One of them is their concentration that does not last long. Moreover, supportive surroundings also influence the ease of application utilization, especially parents' involvement in facilitating their learning. A study by Ilmanto et al. (2021) mentioned that parents' difficulty following their children while they study were limited network quotas, and the nature of material provided online or online may not necessarily be understood by all pupils, all of which make learning at home challenging. Lastly, the network facility also becomes an unbearable challenge that young students face, such as the unstable internet connection because of the unpredictable weather. This condition is relevant with the research done by Giatman et al., (2020) revealing that 47.7% of the respondents reported that signal difficulties became a very important issue in online learning. Therefore, it is really important to make an attempt to make sure that the connection is good before the learning begins.

After presenting the common difficulties that young students experienced during online learning, the following step is looking at the specific challenges they met. The division of the challenges is based on the two types of online learning modes, synchronous and asynchronous (Cleveland-Innes & Ally, 2004). The following is the description of each type.

3.1. Synchronous Learning Platforms

Synchronous learning is a learning process in which teachers and students are getting along at the same time but in different places. In this learning environment, the learning process usually takes place using communication technology media in the form of video-conferencing or audio-conferencing (Purnama, 2020). The steps in synchronous learning are actually not much different from face-to-face learning, where in synchronous learning the learning process also consists of opening activities, core activities and closing activities. From the literature search, two learning platforms that are commonly used to teach children recently are presented below, Zoom and Skype. This table also presents the challenges or handicaps that young students meet when using the applications.

Table 1. Students' Challenges in Using Synchronous Learning Platforms

Author(s)	Year	Application/Platform	Handicaps
Todd	2021	Zoom	Internet bandwidth that sometimes makes the video freezing.
Anggraheni et al.	2020	Zoom	lagging or losing connectivity during the session.
Ganesha et al.	2021	Zoom	Electronic media and internet quotas for online learning are among the challenges. The only issue is that not all students are equal in terms of economics.
Ockert	2017	Skype	Need assistance from adults.

The use of zoom meeting media facilitates online implementation where students are easier to access and use. With the use of this media is expected to improve student learning outcomes even without face to face. The zoom meeting application can be used in the teaching and learning process so that there is interaction between teachers and students in every learning activity. Through this zoom meeting, in addition to explaining the material, teachers can also discuss or ask questions directly with students (Mahayoni, 2020). Many researchers believe that Zoom has many benefits for teaching students in elementary school (Bina & Tahel, 2021; Dwiyansaputra et al., 2021; Marwanto, 2021). This implies that Zoom is seen as a learning platform that is suitable to teach young learners in different subjects.

However, besides the positive benefits, Zoom also has some drawbacks, especially in relation to the challenges that students meet during its utilization. As an instance, the difficulties in its implementation include inadequate facilities and infrastructure, disrupted internet connections, wasteful use of internet quotas and teachers who cannot fully control students (Kelana et al., 2020). In line with this, Ganesha et al. (2021) mentioned that electronic media and internet quotas for online learning are among the challenges. The only issue is that not all students are equal in terms of economics. The stability of the signals as discussed before is also present as a common challenge that students meet in conducting synchronous learning via Zoom meeting. The video can sometimes suddenly freeze or lag and the connection is automatically off (Anggraheni et al., 2020; Todd, 2021). This is also supported by evidence from the study conducted by Perangin-angin et al., (2019) who conducted research in a math class. They mentioned that the obstacle that is faced by students during the learning process using the zoom app on material transformation geometry is on a network that hinders learning. This situation does noy only happen in Zoom Meeting but also in Skype usage.

In the classroom, Skype helps students to improve speaking skills by speaking directly with the original speaker (Eaton, 2010). Students who come from different geographic locations can be connected via Skype with help from the teacher or parents. Students can use Skype to learn between students, both nationally and internationally. This can be done with the collaboration feature (free video calls and video conferencing) available on skype. Furthermore, the teacher can communicate with parents of students via skype video conference about activities in class (Susanti, 2018). In short, similar to Zoom, skype also provides many benefits for online teaching and learning activities.

On the other hand, students also face difficulties when using Skype. As reported by Ockert (2017), young students need adult assistance or guidance in using skype. This is because the Skype application is a bit confusing in the beginning. Thus, parents' guidance when online learning using skype is necessary. Susanti (2018) proposed challenges that are potential to happen during skype-based learning. She stated that Skype posed many challenges in implementation, such as the extra time needed to overcome wireless microphones, because students especially do not really know about it and no help from technicians in preparation for all that besides network problems. Moreover, the use of the

Skype application is still new to them so some problems sometimes occur, like problems sending wrong/less email addresses appropriately. In conclusion, young students need more adaptation to the online learning platforms and require assistance from adults to get used to the usage.

3.2. Asynchronous Learning Platforms

In a different perspective, learners are also faced with the situation that requires them to learn autonomously at home, using learning applications asynchronously. Asynchronous online learning is a learning environment that does not require students and teachers to sit in a similar time. There might be a time gap between them. In a more detailed explanation, Purnama (2020) stated that asynchronous learning is the learning process or deepening of material that can be done at any time without being limited by time. This learning environment can use communication technology that is currently developing, for example with e-learning, Google classroom, Moodle, game applications, and so on. In Table 2, we can see eleven examples of the applications that have been used by children when conducting online learning asynchronously as well as the difficulties they have encountered.

Table 2. Challenges of Students During Asynchronous Online Learning

Author(s)	Year	Application/Platform	Handicaps
Saric et al.	2021	3D game called Colorful Classroom	Requiring teachers/ parents' control more.
Ellis-Barrett	2017	Tondoo	Requiring creativity to create a story. Children cannot do it alone. They need guidance to arrange the story.
Aljojo et al.	2019	Kids' Atlas	Lack of facility because the application is not accessible to everyone and not free or low cost downloadable.
Citananiuc & Iftene	2018	GeoAR	A bit confusing, needs teacher's guidance or parent's control.
Nagata et al.	2010	Chanting robot	Requiring teachers/ parents' control more.
Liu & Liu	2015	Games	Too much use makes children bored. Thus, the utilization needs control from parents.
Ávila-Soto et al.	2010	TanMath	A bit complex for children. Explanations and examples are important; thus, parents or teachers need to provide solutions for that.
Anwar et al.	2020	Mobile Game	Short concentration span that a child has makes it difficult to stay still in a similar game.
Skiada et al.	2014	EasyLexia	Limited to children with learning difficulties. Common kids will find it boring because they think it is less challenging.
Alias	2011	Java Interactive	Children need assistance or guidance to make sure that they play the application properly.

Author(s)	Year	Application/Platform	Handicaps
Lee et al.	2017	Augmented Reality	The students' usage time must be well monitored.

Table 1 reported numbers of challenges that the young students experienced when using certain technological based applications. For example, a study conducted by Ávila-Soto et al. (2010) who conducted a study in a math class for elementary school. They developed a learning application namely TanMath to help children learn math easier. However, they found out that the application was a bit complex for children. Thus, explanations and examples are important; thus, parents or teachers need to provide solutions for that. In short, parents' or adults' control is really important in helping children adjust with the application. Moreover, Aljojo et al. (2020) have developed a learning application for learning Geography for kids, namely Kids' Atlas. In their study, they informed that the use of this application is limited because of the price. Thus, students lack the facility for this application. Not easy access is free to everyone nor low cost or downloadable.

Interesting applications that push students to engage in online learning are among the strategies that teachers can implement. One of them is through Games application (Sáez-López et al., 2015. However, this application is also without challenges. The study of Liu & Liu (2015) mentioned that when children are given Games for learning too long or too much, they will get bored, because they have a short concentration span. Thus, the utilization needs control from parents. Furthermore, Ellis-Barret (2017) displayed the use of Toondoo in teaching elementary school students. In her article, she stated that this application required creativity to create a story, however, children cannot do it alone. They need guidance from adults to arrange the story. This application also has limitations for those who have low creativity (Fatimah et al., 2019). To conclude this paragraph, a highlight on students' adaptation competence is important. Most children recently are quite adaptable towards technology. So, it is not difficult to get them engaged with any new learning applications.

4. CONCLUSION

This study investigated students' difficulties in utilizing learning application during online teaching and learning. The focus of the study is elementary school students which are categorized as young learners. The applications that are meant in this research refer to technological devices, such as Zoom, Skype, Mobile Games, Toondoo, GeoAR, TanMath, Chanting robot, etc. The literature search was done to answer the research question. From the findings of the study, it can be understood that children experienced difficulties in three main areas namely their personal state, environmental influence, and network facilities. Both in synchronous and asynchronous online platforms, these three situations still are impactable. Limitations of this study are related to the research focus. The database was large and not specific. Therefore, the next researchers can specify the focus of the study into a particular application for particular subject. The invitation for action research is also welcome, especially in the improvement of online learning quality for children using technology.

REFERENCES

Afif, Y., & Dwijayanto, A. (2021, February). Moderate Islamic Education and Religious Digital Literature: The Making of Children's Moderate Identities Through the NU Kids Application. In *ICIS 2020: Proceedings of the 2nd International Conference on Islamic Studies* (p. 68).

Ali, G. E., & Magalhaes, R. (2008). Barriers to implementing e-learning: a Kuwaiti case study. *International journal of training and development*, *12*(1), 36-53.

Alias, N. F. (2011). Java Interactive Application for Teaching Long Division to Kids. Thesis: Unpublished.

Anwar, N., Kristiadi, D. P., Novezar, F. A., Tanto, P. A., Septha, K., Ardhia, P., ... & Abraham, J. (2020). Learning Math through Mobile Game for Primary School Students. *Sylwan*, *164*(5), 346-352.

Ávila-Soto, M., Valderrama-Bahamóndez, E., & Schmidt, A. (2017, June). TanMath: A Tangible Math Application to support children with visual impairment to learn basic Arithmetic. In *Proceedings of the 10th International Conference on PErvasive Technologies Related to Assistive Environments* (pp. 244-245).

Bhatt, I., & MacKenzie, A. (2019). Just Google it! Digital literacy and the epistemology of ignorance. *Teaching in Higher Education*, *24*(3), 302-317.

Bina, N. S., & Tahel, F. (2021). Penggunaan Aplikasi Autograph Berbasis Zoom Untuk Pembelajaran Matematika Masa Kini. *J-ABDI: Jurnal Pengabdian kepada Masyarakat*, *1*(1), 31-38.

Carson, D., Gilmore, A., Perry, C. and Gronhaug, K. (2001), Qualitative marketing research, London: Sage

Chitaniuc, M., & Iftene, A. (2018). GeoAR-An Augmented Reality Application to Learn Geography. *Romanian Journal of Human-Computer Interaction*, *11*(2).

Cleveland-Innes, M., & Ally, M. (2004). Affective learning outcomes in workplace training: A test of synchronous vs. asynchronous online learning environments. *Canadian Journal of University Continuing Education*, *30*(1).

Collis, J. and Hussey, R. (2003), Business research, 2 nd ed, Palgrave MacMillan

Dwiyansaputra, R., Wijaya, I. G. P. S., Bimantoro, F., Nugraha, G. S., & Aranta, A. (2021). Pelatihan Penggunaan Aplikasi Zoom Untuk Proses Pembelajaran Daring Pada Masa Pandemi Covid-19 Di SD Negeri 10 Cakranegara. *Jurnal Begawe Teknologi Informasi (JBegaTI)*, *2*(1).

Eaton, S. E. (2010). How to use Skype in the ESL/EFL classroom. *The Internet TESL Journal*, *16*(11), 1-14.

Ellis-Barrett, L. (2017). Toondoo. *The School Librarian*, *65*(3), 148.

Fatimah, A. S., Santiana, S., & Saputra, Y. (2019). Digital comic: an innovation of using toondoo as media technology for teaching English short story. *English Review: Journal of English Education*, *7*(2), 101-108.

Ganesha, P., Nandiyanto, A. B. D., & Razon, B. C. (2021). Application of online learning during the Covid-19 pandemic through zoom meeting at elementary school. *Indonesian Journal of Teaching in Science*, *1*(1), 1-8.

Giatman, M., Siswati, S., & Basri, I. Y. (2020). Online learning quality control in the pandemic Covid-19 era in Indonesia. *Journal of Nonformal Education*, *6*(2), 168-175.

Guo, S. (2020). Synchronous versus asynchronous online teaching of physics during the COVID-19 pandemic. *Physics Education*, *55*(6), 065007.

Harris, K. L. (1996). Content analysis in negotiation research: a review and guide. *Behavior Research Methods, Instruments and Computer, 28*(3), pp. 458-467

Harwood, T. G., & Garry, T. (2003). An overview of content analysis. *The marketing review*, *3*(4), 479-498.

Ilmanto, A. H., Fahyuni, E. F., & Harahap, A. (2021). The Problems of Online Learning: The Role of Parents During the Covid-19 Pandemic. *Nazhruna: Jurnal Pendidikan Islam*, *4*(2), 284-293.

Kelana, J. B., Wulandari, M. A., & Wardani, D. S. (2021). Penggunaan aplikasi zoom meeting di masa pandemi covid-19 pada pembelajaran sains. *Jurnal Elementary: Kajian Teori Dan Hasil Penelitian Pendidikan Sekolah Dasar*, *4*(1), 18-22.

Lapitan Jr, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Education for Chemical Engineers*, *35*, 116-131.

Lee, L. K., Chau, C. H., Chau, C. H., & Ng, C. T. (2017, June). Using augmented reality to teach kindergarten students english vocabulary. In *2017 International symposium on educational technology (ISET)* (pp. 53-57). IEEE.

Lelawati, S., Dhiya, S., & Mailani, P. N. (2019). The teaching of English vocabulary to young learners. *PROJECT (Professional Journal of English Education)*, *1*(2), 95-100.

Liu, S., & Liu, J. X. (2015). The application of games in English vocabulary teaching in kindergartens. *Sino-US English Teaching*, *12*(8), 561-567.

MacEachren, A. M., Harrower, M., Li, B., Howard, D., Downs, R., & Gahegan, M. (2002, May). Supporting statistical, graphic/cartographic, and domain literacy through online learning activities: MapStats for Kids. In *Proceedings of the 2002 annual national conference on Digital government research* (pp. 1-5).

Mahayoni, N. M. S. (2020). Penggunaan Aplikasi Zoom Meeting Pada Pembelajaran Agama Hindu Di Masa Pandemi. *Jurnal Widya Sastra Pendidikan Agama Hindu*, *3*(1), 47-53.

Marwanto, A. (2021). Pembelajaran pada Anak Sekolah Dasar di Masa Pandemi Covid 19. *Jurnal basicedu*, *5*(4), 2097-2105.

M Maskar, S., Dewi, P. S., & Puspaningtyas, N. D. (2020). Online Learning & Blended Learning: Perbandingan Hasil Belajar Metode Daring Penuh dan Terpadu. *Prisma*, *9*(2), 154-166. oore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and higher education*, *14*(2), 129-135.

Mulyono, H. (2016). Using Quipper as an online platform for teaching and learning English as a foreign language. *Teaching English with Technology*, *16*(1), 59-70.

Nagata, R., Mizumoto, T., Funakoshi, K., & Nakano, M. (2010, September). Toward a chanting robot for interactively teaching English to children. In *Proceedings of INTERSPEECH Satellite Workshop on Second Language Studies: Acquisition, Learning, Education and Technology* (pp. 2-13).

Nikolova, A., & Georgiev, V. (2021). Using Serious Games in e-Learning for Kids. In *INTED2021 Proceedings. 15th International Technology, Education and Development Conference* (pp. 621-625).

Ockert, D. (2017). The positive influence of Skype exchanges on Japanese elementary students' affect. *Accents Asia*, *9*(2), 11-15.

Parangin-angin, D. S., & Khayroiyah, S. (2021). Analisis Kemampuan Spasial Visualization Siswa Pada Materi Geometri Transformasi Menggunakan Aplikasi Zoom Di SMA Persiapan Stabat TP 2020/2021. *MAJU: Jurnal Ilmiah Pendidikan Matematika*, *8*(2).

Purnama, M. N. A. (2020). Blended Learning Sebagai Sarana Optimalisasi Pembelajaran Daring Di Era New Normal. *SCAFFOLDING: Jurnal Pendidikan Islam dan Multikulturalisme*, *2*(02), 106-121.

Rohmah, F. (2016). Analisis kesiapan sekolah terhadap penerapan pembelajaran online (e-learning) di SMA Negeri 1 Kutowinangun. *Jurnal Elektronik Pendidikan Teknik Informatika*, *5*(4).

Sáez-López, J. M., Miller, J., Vázquez-Cano, E., & Domínguez-Garrido, M. C. (2015). Exploring application, attitudes and integration of video games: MinecraftEdu in middle school. *Sáez-López, JM, Miller, J., Vázquez-Cano, E., & Domínguez-Garrido, MC (2015). Exploring Application, Attitudes and Integration of Video Games: MinecraftEdu in Middle School. Educational Technology & Society*, *18*(3), 114-128.

Sarić, R., Halilović, M., Bajramović, D., Raducan, G., & Čustović, E. (2021, June). Development of 3D Serious Game: Colorful Classroom to Effectively Teach Children Colors Letters and Numbers. In *International Symposium on Innovative and Interdisciplinary Applications of Advanced Technologies* (pp. 248-263). Springer, Cham.

Skiada, R., Soroniati, E., Gardeli, A., & Zissis, D. (2014). EasyLexia: A mobile application for children with learning difficulties. *Procedia Computer Science*, *27*, 218-228.

Susanti, S. (2019, April). Penelitian Tindakan Kelas Penggunaan Skype untuk Meningkatkan Kemampuan Berbicara pada Siswa-Siswi STMIK Pontianak. In *Proceeding Seminar Nasional Sistem Informasi dan Teknologi Informasi* (Vol. 1, No. 1).

Todd, J. (2021). A [Graphic] Novel Way of Teaching: How to Teach Children How to Write and Draw a Graphic Novel through Zoom. *Children and Libraries*, *19*(1), 24-26.

Utami, Y. P., & Cahyono, D. A. D. (2020). Study at home: Analisis kesulitan belajar matematika pada proses pembelajaran daring. *Jurnal Ilmiah Matematika Realistik*, *1*(1), 20-26.

Vasudevan, S. K., Abhishek, S. N., Swathi, S., Lakshmi, A., & Anandaram, S. (2019). Learn quest-a virtual reality-based system for training autistic kids. *International Journal of Medical Engineering and Informatics*, *11*(2), 103-115.

Yazdi, M. (2012). E-learning sebagai Media Pembelajaran Interaktif Berbasis teknologi Informasi. *Jurnal Ilmiah Foristek*, *2*(1), 143– 152