UTILIZING VIRTUAL REALITY IN LEARNING FOR ELEMENTARY SCHOOLS DURING COVID 19 PANDEMIC

Imam Dwi Upayanto and **Wuri Wuryandani**
Yogyakarta State University, Yogyakarta Indonesia
imamupayanto@gmail.com; wuri_wuryandani@uny.ac.id

Abstract: The use of technology in education has increased during the COVID-19 pandemic. One of the educational technologies that can be utilized during the COVID-19 epidemic is virtual reality. Virtual reality is still a new technology and encounters several obstacles in its use. This study aims to examine the use of virtual reality during the COVID-19 pandemic at the elementary school level. This study uses a qualitative approach to phenomenological methods. Data were collected using interviews and observations of 10 teachers and 40 students in 4 provinces of indonesia. Data analysis was carried out by dividing each theme, then finding the relationship between the themes. This study found that the use of virtual reality can help students learn when a regional quarantine is imposed. In addition, virtual learning experiences can train students to be able to think concretely about the subject matter being taught. However, limited virtual reality content becomes one of the obstacles to its utilization.

Keywords: *Virtual reality, Learning in Elementary Schools, Covid 19*

INTRODUCTION

The Covid 19 pandemic has a significant impact on various aspects of life. The government feared that the number of Covid 19 cases increased every day. Thus, they limited public access for people to carry out mass gathering activities. Educational institutions are affected because they experience a slowdown in the teaching and learning process. The social distancing policy also triggered the government to implement a system of closing schools to an undetermined time limit.

The Covid 19 pandemic has a significant impact on the school (Nuland, Mandzuk, Petrick, & Cooper, 2020). Students are required to study online at home with short studying hours. Communication between teachers and students is limited, so learning materials cannot be conveyed optimally. This causes some students to experience a decrease in their academic target scores. Many students become less disciplined and unmotivated, so they leave school work to their parents. Of course, these various effects must be anticipated by the school. Teachers must be able to create lessons that can motivate students to learn during the pandemic.

Students during the Covid 19 pandemic depended heavily on technology in their studies. The variety of technology in learning has a significant effect on student motivation. Virtual reality is a technology that can be used by students to learn (Ai-Lim Lee, Wong, & Fung, 2010). This learning technology can produce virtual spaces that students can explore. When using virtual reality, students can learn directly in a fictional environment arranged according to the teacher's goals. Virtual reality technology can take students to various places without having to move physically. This is because of virtual reality's ability to create replicas from the real world (Linowes, 2015).

Virtual reality has various positive impacts when used as a medium of learning in schools (Ai-Lim Lee, Wong, & Fung, 2010). This technology is able to bring students to think concretely, providing an in-depth experience of a subject matter. Virtual reality can be used as an alternative in learning when students cannot learn directly in open spaces. Current conditions that restrict students from leaving home make learning to use virtual reality the right solution. This is because the government and schools can make videos and simulations related to learning materials that students can use during the Covid 19 pandemic.

METHOD

This study is a descriptive exploratory study to discover and describe virtual reality in elementary schools during the COVID 19 pandemic. This study used a qualitative approach using the phenomenological method. I stayed up past my bedtime. I couldn't wake up in the morning. By noon, I was exhausted. Participating schools came from 4 provinces in Indonesia, namely Central Java, East Java, Yogyakarta, and West Nusa Tenggara.

This study uses a mobile-based virtual reality device on the subject matter of recognizing traffic signs. The content used is taken from "Upay and Mon" and "Airplane", which are YouTube channels (Mon, 2020) (VR, 2020).

At first, initial interviews were conducted to determine the initial understanding of learning during Covid 19 pandemic. Then an interview was conducted to see the response to the use of virtual reality in learning. Materials interview include (1) teacher's and students' response in learning during Covid 19 pandemic; (2) the introduction of virtual reality; (3) the mastery of utilizing virtual reality; and (4) content availability. Meanwhile, the observation material covers the entire learning process when using virtual reality devices. The researcher was the primary research tool in this study. The study was conducted from March to August 2020.

Data records in the interviews were then reduced. The result of the reduction is then presented in a tabular form. After that, some themes and sub-themes were sought in relatively small groups of data. Data analysis was performed by determining the relationship between themes and sub-themes to obtain an understanding by using the Bogdan and Biklen Model (Bogdan & Biklen, 1982). In this study, the relationship between themes and sub-themes were used to obtain an understanding of the utilization of virtual reality in elementary school during Covid 19 pandemic.

On the research procedures, participants were allowed to learn about the purpose and their involvement in the study. To ensure anonymity, all participants' names were kept confidential so that the personal data of participants and participation during the study do affect the careers and their future academic positions

FINDINGS AND DISCUSSION

Interviews and observations are grouped according to theme into the main material for checked, then reduced in sub-themes; after that, connected between sub-themes are to get a final conclusion.

Initial conditions in the classroom after Covid 19 outbreak

The Covid 19 pandemic has caused schools to adapt to managing their learning process (König, Jäger-Biela, & Glutsch, 2020). Teachers in the early days of the pandemic must learn various learning technologies that can be used by students. Students also experience difficulties. Thus, they need help from their parents when studying. The process of adapting technology by the teachers and students during the Covid 19 pandemic takes time. It takes at least one month for students and teachers to adapt to online-based learning. Apart from difficulties in adapting, the lack of learning materials available on the internet also made it difficult for teachers.

Table 1. Initial conditions in the classroom after Covid 19 outbreak

No.	Sub-themes	The relationship between sub-themes	Conclusion
1.	Teachers had difficulty adapting to the early days of Covid 19	Teachers and students had difficulty adapting to the early days of the Covid 19 pandemic	During the Covid 19 pandemic, both teachers and students had to adapt to technology, but because of sudden changes, they experienced difficulties.
2.	Students experienced learning difficulties		
3.	Teachers have not mastered technology in learning	Mastery of learning technology becomes an obstacle for teachers and students	
4.	Not all students are able to use technology in learning		
5.	Teachers lack references for teaching online	Limited quality teaching materials make learning difficult	
6.	Limited learning content makes it difficult for students to learn		

Using Virtual Reality in the Classroom

The use of virtual reality in learning during the Covid 19 pandemic received positive responses from schools. Teachers are very impressed with the features that can be presented in virtual reality because it is very effective in teaching concepts. Understanding a concept in a learning material is very important for students

(Novianti & Retnawati, 2019). Students, in this case, also showed a positive response when using virtual reality. They feel more comfortable learning and can actively seek out the information they need in the virtual world. The existence of various restrictions during the Covid 19 pandemic can be overcome by using virtual reality. Thus, all the limitations in learning during the pandemic become more fun and enjoyable. The result is also confirmed by the findings of other researchers, Tussyadiah, Wang, Jung, & Dieck (2018) who stated that virtual reality makes learning more fun and easy to understand.

Table 2. Using virtual reality in the classroom

No.	Sub-themes	The relationship between sub-themes	Conclusion
1.	Virtual reality is very interesting and motivating students	Virtual reality has a positive impact on the development of students' knowledge	The school's response to the use of virtual reality is positive because it can help students and allows teachers to teach difficult material. Virtual reality is so suitable for learning in class during Covid 19 pandemic.
2.	Virtual reality can improve students' skills, such as critical thinking and creativity		
3.	Virtual reality can help students to learn contextually	Virtual reality can help learn a difficult concept	
4.	Virtual reality can facilitate student to learn difficult concepts		
5.	Virtual reality can help teachers in learning during a pandemic	Virtual reality is suitable for use in learning during the Covid 19 pandemic	
6.	The imaginary world can be an alternative to outdoor learning during a pandemic		

Challenges in Using Virtual Reality

Using virtual reality tools is actually relatively easy, but in practice, it still encounters various obstacles. The results of the study found that neither teachers nor students were fully comfortable using virtual reality devices. The teacher still seems to lack control in the process of adapting to the virtual world. The limited content that can be used in learning is also an obstacle in its use. Some quality learning content tends to be paid for and is relatively expensive. Some of these obstacles are encountered because virtual reality is still relatively new, so there are still many obstacles to be found. Other researchers also mentioned difficulties in adaptation, stating that new learning technologies such as virtual reality do need to adapt before their widespread use (Velev & Zlateva, 2017).

Table 3. The Challenges

No.	Sub-themes	The relationship between sub-themes	Conclusion
1.	Virtual reality-based learning contents are hard to find	Virtual reality for learning content is still limited	Neither virtual reality tools nor their content are widely known and are still limited. So it is difficult for teachers and students to utilize this device.
2.	Virtual reality content is mostly limited to entertainment purposes only		
3.	Virtual reality application for learning mostly not free		

No.		
4.	Prices affordable smartphone version of the device, but the price of smartphones that support virtual reality relatively expensive	Virtual reality device is still limited and not yet reached school
5.	Virtual reality technology is not widely known	

The Input for Future Virtual Reality utilization

After learning using virtual reality, teachers and students are very supportive of the use of this technology in the future. Virtual reality can be used in various learning models, especially during the Covid 19 pandemic. Some things that need to be the focus of its development are the quality of the content and the affordability of tools for all people. In the content section, it needs to be adjusted to the curriculum provided by the government. The linkage between virtual reality content and government curriculum will facilitate the future adaptation of this technology. In terms of equipment availability, it can also be assisted by development from the government. So that product specifications in accordance with safety and comfort can be fulfilled. In general, the presence of technology, such as virtual reality, needs support from the government, especially during the Covid 19 pandemic. The use of technology in education can improve the quality of learning and make it easier to convey messages to students in this digital era (Kusumaningrum, Suharno, & Triyanto, 2019).

Table 4. The Input for Future Virtual Reality utilization

No.	Sub-themes	The relationship between sub-themes	Conclusion
1.	More virtual reality content in education must be reproduced	Availability of quality virtual reality content in education	There needs to be quality virtual reality content supported by the availability of tools for everyone
2.	The existence of content that is integrated with the government curriculum		
3.	Availability of tools that everyone can afford	The availability of products that are safe and comfortable for everyone	
4.	Availability of virtual reality products that are safe and comfortable		

CONCLUSION

At the beginning of the Covid 19 pandemic, teachers and students had difficulty adapting to the learning process. The use of virtual reality technology is very helpful for both teachers and students. Even though they are at home, virtual reality can facilitate students to learn directly in an artificial environment. The teacher also provides support that virtual reality technology can increase student motivation during the Covid 19 pandemic. However, the limited content and tools that are not yet widely available become obstacles in the use of this learning tool. In the future, it is hoped that quality content and tools will be easily available and will receive support from the government. If this is fulfilled, then virtual reality will be an effective learning solution for students during the Covid 19 pandemic.

REFERENCES

Lee, E., Wong, K., & Fung, Chun. (2010). How Does Desktop Virtual Reality Enhance Learning Outcomes? A Structural Equation Modeling Approach. *Computers & Education*. 55. 1424-1442. 10.1016/j.compedu.2010.06.006.

Bogdan, R., & Biklen, S. K. (1982). Qualitative Research for Education: An Introduction to Theory and Methods. Boston: Allyn and Bacon.

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to Online Teaching During COVID-19 School Closure: Teacher Education and Teacher Competence Effects Among Early Career Teachers in Germany. *European Journal of Teacher Education*, 1-15.

Kusumaningrum, A., Suharno, & Triyanto. (2019). Professional Development of a Teacher in the ICT Era. *International Seminar on Language, Education, and Culture* (pp. 203-211). Malang: KnE Social Sciences.

Linowes, J. (2015). *Virtual Reality Unity Project.* Birmingham: Packt Publishing Ltd.

Novianti, M., & Retnawati, H. (2019). Student-teacher's Perception of Mathematical Representation in Mathematics Learning. *ISIMMED2018.* Yogyakarta: IOP Publishing.

Nuland, S. V., Mandzuk, D., Petrick, K. T., & Cooper, T. (2020). COVID-19 and Its Effects on Teacher Education in Ontario: A Complex Adaptive Systems Perspective. *Journal of Education for Teaching*, 1-10.

Tussyadiah, I. P., Wang, D., Jung, T. H., & Dieck, M. T. (2018). Virtual Reality, Presence, and Attitude Change: Empirical Evidence from Tourism. *Elsevier*, 140-154.

Mon, U. A. (2020). Upay and Mon. Retrieved August 1, 2020, from Upay and Mon: https://www.youtube.com/channel/UCngN3EctmnNF2rrkz-6456w

Velev, D., & Zlateva, P. (2017). Virtual Reality Challenges in Education and Training. *International Journal of Learning and Teaching*, 33-37.

VR, A. (2020). AirPano VR. Retrieved August 1, 2020, from AirPano VR: https://www.youtube.com/channel/UCUSElbgKZpE4Xdh5aFWG-Ig