

Conference Paper

The Effect of Virtual Reality Learning Media on Student Social Studies Learning Outcomes in Junior High Schools

Sujarwo*, Japar, and Syarif Sumantri

Universitas Negeri Jakarta, Jakarta, Indonesia

ORCIDSujarwo: <https://orcid.org/0000-0002-1809-1663>Japar: <https://orcid.org/0000-0002-9719-765X>Syarif Sumantri: <https://orcid.org/0000-0002-7354-4477>**Abstract.**

Digital transformation in the Industrial Revolution 4.0 era demands learning activities that reduce the application of the lecture method and influences learning methods as well as the media used. Virtual reality technology permits students to be acquainted with live learning with objects seen directly. This study aims to determine the efficacy of virtual reality learning media in upgrading student learning outcomes in social studies classes. The population group was composed of 72 class VII students of Sekolah Menengah Pertama Negeri 30 Jakarta. This study uses experimental research techniques using experimental class and control class with pre-test and post-test. In this study, data analysis was carried out using inferential analysis using the *t*-test. According to the findings, the use of virtual reality learning media has a positive impact on student learning outcomes. Students can use immersive virtual reality to achieve better learning outcomes. Students are also more interested in learning and effortlessly understand and discover new knowledge and experiences. In addition, students find it more enjoyable to learn using virtual reality learning materials, which is virtual reality.

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1. Introduction

The industrial revolution 4.0 has also hearten a revolution in education sector distinguished by digital transformation in the education sector often known as Education 4.0 [1]. The creation of various forms of multimedia-based learning is currently being greatly influenced by the fast-paced advancement of information and communications technology, which is one of the advances in the field of education [2]. One of the digital learning media that is in accordance with the 4.0 industrial revolution is using Virtual Reality (VR). Virtual reality is a teaching tool that can increase student engagement, motivation, and learning results while also lowering costs. Utilizing VR technology to visualize objects and give them a three-dimensional representation [3]. The creation

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of a virtual environment that supports visual items is the first development step of virtual reality, allowing subsequent users to collaborate directly with the virtual world within the graphical objects. The goal of the virtual environment is to increase students' understanding of the information presented to them.

Based around the idea of transforming social studies learning in harmony with revolution 4.0, it is necessary to reform learning by packaging and integrating social studies learning in technology, this is because technological developments have stimulate social science teachers to update their pedagogy and practice by using technology in the learning process [4]. The utilization of technology in learning social sciences will definitely have a positive and beneficial effect and can assist social learning for students [5,6]. Previous studies have shown that using new technologies to learn will boost motivation compared to traditional learning materials [7]. Based on this explanation, innovation in learning is certainly needed in carrying out learning that is in line with the developments and challenges of the 21st century and the digital era. Teachers need to be creative and innovative in performing digital learning facilities, one of which is by using VR media in learning.

The outcome of research on the use of VR in learning found that VR can be a suitable tool for increasing methodical, practical, and declarative knowledge in tertiary institutions [8]. Another study that compared students learning with VR revealed that students learning with VR obtained higher learning scores on the post-test for their learning performance [9]. This finding is associated with other studies which also discovered that learning in VR can improve learning outcomes [10–12].

Several previous studies that examined interactive learning media, turned out to be able to provide positive answers. Researchers develop interactive VR-based learning media in social studies subjects in junior high school to improve student's learning outcomes by applying virtual reality as a means for teacher learning it is hoped that student learning can more easily understand abstract social material and improve student social studies learning outcomes. Given the previous studies, there are still some researchers who have developed virtual reality interactive learning materials. Therefore, researchers need to construct the media to obtain control of product quality of education in the digital era. Therefore, this study aims to answer several questions, including:

1. How is the use of VR media to improve social studies learning outcomes of 7th graders in secondary school?

2. Can VR media improve social studies learning outcomes of 7th graders in secondary school?

2. Methods

Quantitative approach with quasi-experimental research methods are used in this study. Quasi-experimental is semi-experimental research conducted by handling the research object and having control. The mechanism of this research is to give a pretest before carrying out learning and then conduct experiments using virtual reality media in learning, After that give a posttest to get a comparison of pretest and posttest data. The population taken was class VII students of Sekolah Menengah Pertama Negeri 30 Jakarta for the academic year 2022/2023, totaling 72 students.

Table 1. Research Design

TABLE 1:

Group	Pre-test	Treatment	Post-test
A	O_1	X	O_2
B	O_1	0	O_2

Notes: O_1 = Pre-test given treatment; O_2 = Post-test given treatment; X = treatment in the form of VR media

3. Results and Discussion

Based on the pretest and posttest data obtained during the study. The data is used to compare student learning outcomes in social studies subjects between the experimental class that uses VR media and the control class that does not use VR, only using presentation slides. Comparison data of pretest and posttest values in the experimental class and control class are shown in Table 2.

Based on Table 2. it is evident that the average pretest value for the experimental class was 58.13, while the control class, acquired an average value of 54.08. This means that there is a difference in pretest and posttest scores between the experimental class and the control class, namely 4.05. Meanwhile, the posttest average score in the experimental class was 80.36, and in the control class was 73.25. This means that there is a difference of 7.11 between the posttest average scores of the experimental class and the control class. The pretest score in the control class was 54.08, an increase of 19.17 to 73.25 in the posttest score. Hypothesis testing in a study is the most important because it is necessary to check the veracity of the hypothesis in that study. The hypothesis of

TABLE 2: Data Recapitulation of Test Instrument Results.

Data	Pre-Test		Post-Test	
	Eksperiment	Control	Eksperiment	Control
Students	36	36	36	36
Score Min	38	31	56,00	50
Score Max	72	72	94,00	91
Means	58,13	54,08	80,36	73,25
Median	58	54,8	79,8	73,5
Modus	57,58	54,92	79,00	73,92
Variant	110,58	138,85	72,18	77,90
Standart Deviasi	10,51	11,78	8,49	8,82

this study is “The effect of the use of virtual reality in social studies learning on social studies learning outcomes for class VII in secondary school”.

The calculation results of the t-count are compared with the t-table at a significant level. Hypothesis H0 is accepted if $t\text{-count} \leq t\text{-table}$. The H1 hypothesis is accepted if $t\text{-count} \geq t\text{-table}$.

TABLE 3: Hypothesis Test Results in T-test.

α	$dk = n_1 + n_2 - 2$	t-count	t-table
0,05	70	4,222	1,994

Based on calculations through statistical data analysis techniques with the t-test, the results of hypothesis testing using the t-test, it is known that $t\text{-count} = 4.222$ and $t\text{-table} = 1.994$. Obtained $t\text{-count} \geq t\text{-table}$, namely $4.222 \geq 1.994$, thus H1 is accepted and H0 is rejected.

By the hypothesis testing of the t-test calculation above, it can be concluded that there is an influence. The influence of using virtual reality in social studies learning on social studies learning outcomes for class VII in junior high school on the interaction material between spaces. Based on the results of this study, it can be seen that the use of VR in learning has a positive impact on ameliorate students’ social studies understanding and learning outcomes. The results of this study reinforce the results of previous research, that learning using VR for students has better learning outcomes compared to learning using printed materials and web-based application materials [13]. Students who learn with VR show that students who learn with VR get higher learning scores on the post-test for learning performance [9–13]. Academic achievement and student engagement scores were higher in terms of cognitive, behavioral, emotional, and social students compared to students with traditional classes [14,15].

The results of other research on the use of VR in learning found that VR can be a suitable tool for increasing methodical, practical, and declarative knowledge [8]. The use of virtual reality can also increase fun and learning outcomes, so as to increase environmental awareness. VR can prevail over challenges by providing a communal controlled environment by providing vision and aural feedback [16]. Virtual reality is an effective alternative to providing vision and aural feedback and allowing users to move in space like in real life.

Based on the results of this study and the results of previous studies, it can be seen that the use of VR in learning can be used as a digital learning medium that can provide interesting experiences to students, the use of VR can improve student learning performance in lessons, using VR can have an effect on student learning performance because it provides opportunities for students to be involved in the lesson. Virtual reality can take the benefit of natural and immersive interactions in virtual environments, such as active listening, attention, and timing.

4. Conclusion

Overall, this study proved that virtual reality media has a positive influence on student learning outcomes in social studies subjects in the material of interaction between spaces. Students are able to quickly get new experiences in learning interaction material between spaces because students seem to be in the location they are studying. By this way, learning can be considered more exciting and enjoyable. Increased knowledge about various technology-based immersive learning media must be avail to make teaching materials easier for students to acknowledge, as well as to offer learning materials in a more attractive and efficient manner and to elevate learning models in the era of globalization. This VR-based learning media can be recommended for further research to improve student learning outcomes in social studies classes at junior high schools. Further research needs to be carried out worldwide to realize and understand the impact of virtual reality-based learning materials on student learning outcomes.

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