



THE EFFECT OF THE USE OF DIGITAL LEARNING MEDIA ON THE INCREASE UNDERSTANDING OF STUDENT MATERIAL

Tuti Marlina¹

¹Al-Fitrah Institut Surabaya East Java, Indonesia

Email : tutimarlina@alfitrah.ac.id¹

DOI:

Received: 23 Mei 2026

Accepted: 21 Juni 2026

Published: 30 Juni 2026

Abstract : This study aims to investigate the effect of the use of digital learning media on improving students' understanding of material at Rungkut Kidul 2 Surabaya Elementary School. This study uses an experimental design with a quantitative approach. The research population is grade 4 students at Public Elementary Schools Rungkut Kidul 2 Surabaya, with samples taken using purposive sampling techniques. The sample was divided into two groups, namely the experimental group that used digital learning media and the control group that used conventional learning methods. Data was obtained through pretest and posttest which contained questions about mathematics and Indonesian learning materials.

Data analysis used a *paired sample t-test* to see the difference between the pretest and posttest results in the two groups. The results showed that the experimental group experienced a significant improvement, with the average posttest score increasing from 65 to 85, while the control group only increased from 66 to 74. The results of the statistical test showed that the p-value for the experimental group was 0.000, which means that the increase was significant ($p < 0.05$), while the control group had a p-value of 0.007.

These findings show that the use of digital learning media can significantly improve students' understanding of material compared to conventional learning methods. However, the limitations of technology tools and teacher training are challenges in its implementation. Therefore, it is recommended that the school continue to develop technological facilities and provide further training for teachers.

Keywords: *Digital Learning Media, Material Comprehension, Elementary School, Statistical Test, Pretest-Posttest*

Abstrak : Penelitian ini bertujuan untuk mengkaji pengaruh pemanfaatan media pembelajaran digital terhadap peningkatan pemahaman siswa terhadap materi di SD Rungkut Kidul 2 Surabaya. Penelitian ini menggunakan desain eksperimental dengan pendekatan kuantitatif. Populasi penelitian adalah siswa kelas 4 SDN Rungkut Kidul 2 Surabaya, dengan sampel diambil menggunakan teknik purposive sampling. Sampel dibagi menjadi dua kelompok, yaitu kelompok eksperimen yang menggunakan media pembelajaran digital dan kelompok kontrol yang menggunakan metode pembelajaran konvensional. Data diperoleh melalui pretest dan posttest yang berisi pertanyaan tentang matematika dan materi pembelajaran bahasa Indonesia.

Analisis data menggunakan *uji-t sampel berpasangan* untuk melihat perbedaan antara hasil pretest dan posttest pada kedua kelompok. Hasil penelitian menunjukkan bahwa kelompok eksperimen mengalami peningkatan yang signifikan, dengan rata-rata skor pascates meningkat dari 65 menjadi 85, sedangkan kelompok kontrol hanya meningkat dari 66 menjadi 74. Hasil uji statistik menunjukkan bahwa nilai p untuk kelompok eksperimen adalah 0,000, yang berarti bahwa peningkatannya signifikan ($p < 0,05$), sedangkan kelompok kontrol memiliki nilai p 0,007.

Temuan ini menunjukkan bahwa penggunaan media pembelajaran digital dapat secara signifikan meningkatkan pemahaman siswa terhadap materi dibandingkan dengan metode pembelajaran konvensional. Namun, keterbatasan alat teknologi dan pelatihan guru menjadi tantangan dalam implementasinya. Oleh karena itu, disarankan agar sekolah terus mengembangkan fasilitas teknologi dan memberikan pelatihan lebih lanjut bagi guru.

Kata Kunci: *Media Pembelajaran Digital, Pemahaman Materi, Sekolah Dasar, Tes Statistik, Pretest-Posttest*

INTRODUCTION

The rapid development of digital technology in various fields has changed many aspects of life, including in the world of education. Digital learning media is one of the effective tools to support the teaching and learning process, because it can provide a more interesting and interactive learning experience for students. According to Arsyad (2017), digital learning media not only increases student motivation, but can also make it easier to understand the concepts taught (Arsyad, 2017, p. 21). In the context of basic education, the use of digital learning media is expected to have a significant impact on improving students' understanding of the material.

Elementary School as the first level of education that introduces students to basic concepts in various subjects, is an ideal place to implement digital learning media. At Public Elementary Schools Rungkut Kidul 2 Surabaya, the use of technology in learning has begun to be implemented, but it has not been maximized in all aspects. The teachers at these schools have tried to integrate technology into the learning process, but they face some challenges in terms of choosing the right media and mastery of technology by students.

The use of digital learning media in elementary schools provides opportunities for students to obtain information more easily and quickly. This is in line with the opinion of Prastowo (2016) which states that digital learning media can accelerate the knowledge transfer process, as well as provide opportunities for students to be more active in learning (Prastowo, 2016, p. 53). The use of digital media also allows students to learn independently outside of class hours, by using various applications or learning platforms available.

However, although there are many benefits that can be obtained, the implementation of digital learning media in elementary schools often encounters obstacles. One of them is the limited access to adequate technological devices, as well as the ability of teachers to utilize digital media optimally. This indicates that there is still much that needs to be improved in the implementation of the use of digital learning media in elementary schools. Therefore, this study aims to analyze the influence of the use of digital learning media on improving students' understanding of material at Public Elementary Schools Rungkut Kidul 2

Surabaya.

Research on digital learning media is not new. Previously, several studies have shown that the use of digital media can increase student motivation and understanding. For example, research conducted by Setiawan (2021) shows that technology-based learning media can increase students' understanding of mathematics lessons at the elementary school level (Setiawan, 2021, p. 110). These findings illustrate that the use of digital media has great potential in improving the quality of education.

At Public Elementary Schools Rungkut Kidul 2 Surabaya, despite efforts to integrate digital media in the learning process, there are still many challenges faced by teachers and students. Some of them are limited technological devices, low digital skills of students, and lack of understanding of teachers in utilizing digital media to the fullest. According to Tarmizi (2019), limited access to technology is one of the obstacles in implementing digital learning media effectively (Tarmizi, 2019, p. 72). Therefore, more in-depth research is needed on the extent to which digital learning media can improve students' understanding of material in elementary schools.

The importance of digital learning media in the modern era makes it an integral part of technology-based learning. Digital media-based learning allows students to more easily understand abstract concepts through visualization and interactivity. Therefore, the use of digital learning media is expected to provide a more enjoyable learning experience and can improve understanding of the material, especially for students who have difficulty participating in conventional learning.

Improving students' understanding of material is the main goal in every learning process. Digital learning media has the ability to clarify concepts that are difficult to understand through the use of attractive images, videos, and animations. This is in line with the theory put forward by Mayer (2009) in the principle of multimedia, which states that the combination of text and images in digital media can improve information understanding and retention (Mayer, 2009, p. 39).

Based on this, this study focuses on the influence of the use of digital learning media on improving students' understanding of material at Public Elementary Schools Rungkut Kidul 2 Surabaya. This study not only aims to assess the effectiveness of the use of digital media, but also to identify the challenges faced by teachers and students in implementing digital learning media. With a better understanding of the influence of digital media, it is hoped that the right solution can be found to increase the use of technology in learning in elementary schools.

For this reason, this study will use a quantitative approach with an experimental design to measure the influence of the use of digital learning media on students' understanding of material. In this study, a comparison will be made between classes that use digital media in learning and classes that do not use digital media. Measurement of improvement in material understanding will be carried out through tests and observations of student learning outcomes after using digital learning media.

RESEARCH METHOD

This study uses a quantitative approach with an experimental design to measure the influence of the use of digital learning media on improving students' understanding of the material. The experimental approach was chosen because it allows researchers to control the variables that affect and measure the direct impact of the use of digital learning media on student learning outcomes. The experimental design used is a *pretest-posttest control group design* (Creswell, 2012: 310). In this design, two different groups of students will be given different treatments, namely the use of digital media and conventional learning methods, to measure their influence on students' understanding of the material.

The population of this study is all 4th grade students at Public Elementary Schools Rungkut Kidul 2 Surabaya who are registered in the 2023/2024 school year. The research sample was taken using the purposive sampling technique, namely by selecting two classes that have similar characteristics. One class will be an experimental group that uses digital learning media, while the other class will be a control group that uses conventional learning methods without the help of digital media. The determination of these groups was carried out based on similarity in terms of academic achievement and basic skills before the experiment was conducted.

The instrument used in this study is a material comprehension test that contains objective questions and essays related to the material that has been taught, such as mathematics and Indonesian. This test is used to measure students' understanding before and after the implementation of digital learning media. Before the test is used, the validity and reliability of the instrument are tested by first conducting a test outside of the sample being studied. The validity of the instrument was calculated using *the Content Validity Index (CVR)* formula, while reliability was calculated using *Cronbach's Alpha* (Nunnally & Bernstein, 2010: 264).

Data collection is carried out in two stages. First, a pretest test was given to both groups of students to measure their initial understanding before the learning process was carried out. Then, for four weeks, the experimental group will be taught using digital learning media, such as interactive learning applications and learning videos, while the control group will follow learning using traditional methods such as lectures and textbooks. At the end of the period, the same posttest test as the pretest is given to measure the improvement of students' understanding of the material.

The data obtained from the pretest and posttest tests will be analyzed using *the paired sample t-test* statistical test to determine the difference between the pretest and posttest scores in each group. In addition, *an independent sample t-test* will be used to compare the difference in increased understanding between the experimental group and the control group. This data analysis aims to determine whether the use of digital learning media has a significant influence on the improvement of students' understanding of material at Public Elementary Schools Rungkut Kidul 2 Surabaya (Field, 2013: 49).

FINDINGS AND DISCUSSION

Findings

This study aims to measure the influence of the use of digital learning media on improving students' understanding of material at Public Elementary Schools Rungkut Kidul 2 Surabaya. Based on the data collected, it can be seen that there is a significant difference in material understanding between students who use digital learning media and students who use conventional learning methods.

In the experimental group that used digital learning media, the results of the pretest and posttest showed a significant improvement in students' understanding of the material. For example, the average pretest score for the experimental group was 65, while the average posttest score increased to 85. This increase shows that digital learning media can have a positive impact on students' understanding of the material.

On the other hand, the control group that used conventional learning methods experienced a smaller increase. The average pretest score of the control group was 66, while the posttest score only increased slightly to 74. This difference indicates that digital learning media contributes more to improving student understanding compared to conventional learning methods.

The following table shows the results of the paired *sample t-test* statistical test conducted to analyze the significant difference between the pretest and posttest values of the experimental group and the control group.

Table 1. Test Results Statistik Paired Sample T-Test

Kelompok	Nilai Pretest	Nilai Posttest	Mean Difference	t-value	df	p-value
Eksperimen	65	85	20	6.84	29	0.000
Kontrol	66	74	8	2.93	29	0.007

Information:

1. In the experimental group, a *t-value* of 6.84 with a *p-value* of 0.000 showed that the increase that occurred between the pretest and posttest was very significant ($p < 0.05$).
2. In the control group, although there was an increase in the value, the lower *t-value* of 2.93 with a *p-value* of 0.007 showed a smaller and significant increase, but not as large as in the experimental group.

Based on the results of this analysis, it can be concluded that the use of digital learning media has a significant effect on improving students' understanding of the material.

Discussion

The use of digital learning media in this study is proven to significantly improve students' understanding of material. The improvement that occurred in the experimental group is in line with the theory put forward by Mayer (2009), which states that digital learning media, such as learning videos and interactive applications, can improve students' comprehension through the use of images, animations, and text combined in an easy-to-understand format (Mayer, 2009: 45).

In the experimental group, the use of digital learning media provides

opportunities for students to learn in a more interactive and fun way. For example, game-based learning apps allow students to learn while playing, which indirectly increases their engagement in learning. This is in line with the opinion of Anderson (2018) who stated that educational games can increase student motivation and understanding, especially in subjects that are considered difficult such as mathematics and science (Anderson, 2018: 32).

However, although the results of the study show that the use of digital learning media has a positive impact, there are several challenges faced in its implementation. One of them is the limitation of technological devices owned by schools. Some students at Public Elementary Schools Rungkut Kidul 2 Surabaya have difficulty accessing digital learning media due to the limitations of devices such as computers or tablets. This is in line with the findings put forward by Tarmizi (2019) which states that access constraints to devices and the internet can hinder the effectiveness of the use of digital media in learning (Tarmizi, 2019: 72).

In addition, although digital media is able to improve student understanding, teachers also play an important role in ensuring that the media is used to its fullest. For example, even though learning apps have been provided, some teachers still haven't fully integrated these apps into their learning activities. This shows the importance of training for teachers in the effective use of digital learning media, as suggested by Prastowo (2016), who emphasized that teachers' understanding of educational technology greatly affects the success of the implementation of digital media in learning (Prastowo, 2016: 53).

In the control group, despite the improvement, the results were not as large as in the experimental group. The increase that occurred in the control group may be due to other factors, such as more conventional learning methods and the lack of active involvement of students in the learning process. This supports the argument put forward by Arsyad (2017), which states that learning that is not supported by interactive media tends to limit the potential of students to be actively involved in the learning process (Arsyad, 2017: 25).

The smaller increase in the control group may also be due to the lack of variation in the learning methods used. Students tend to feel less interested if the learning method is only limited to lectures or the use of textbooks. Therefore, it is important for schools to continue to find ways to keep learning interesting and enjoyable for students, both by using digital media and other more creative methods.

Overall, the results of this study show that the use of digital learning media can significantly improve students' understanding of the material, especially in groups that are actively involved in digital learning. Digital learning media not only increases students' motivation to learn, but also helps them understand the material in a more interactive and fun way. Therefore, the implementation of digital media in learning in elementary schools needs to be further encouraged by providing training for teachers and providing more adequate technological facilities.

CONCLUSION

Based on the results of research conducted at Public Elementary Schools Rungkut Kidul 2 Surabaya, it can be concluded that the use of digital learning media has a significant influence on improving students' understanding of material. This is evident from the results of statistical analysis using *the paired sample t-test*, which shows that there is a significant difference between the pretest and posttest scores of the experimental group that uses digital learning media. The increase in the average posttest score in the experimental group was greater than that of the control group that used conventional learning methods.

Digital learning media, which are interactive learning applications and learning videos, are able to attract students' attention and help them understand the material in a more interactive and fun way. This increase in understanding of the material is in line with previous findings that show that digital learning media can increase student motivation and involvement in the learning process (Mayer, 2009: 45). Students who engage in digital learning tend to have a better understanding of the material being taught, as they can learn independently and at a pace that suits their abilities.

However, while the use of digital media has a significant positive impact, challenges such as the limitations of students and teachers' technological devices and skills still need to be addressed. Therefore, it is recommended that schools provide further training for teachers in utilizing digital media optimally and increasing access to technological devices needed by students.

Overall, this study shows that the use of digital learning media is an effective alternative to improve students' understanding of material at the elementary school level. Wider and systematic implementation in various elementary schools is expected to have a greater impact on the quality of education in Indonesia, especially in increasing student motivation and understanding.

REFERENCES

- Anderson, C. A. (2018). *The Impact of Educational Games on Student Learning: A Review of Literature*. *Journal of Educational Technology*, 15(1)
- Arsyad, A. (2017). *Media Pembelajaran*. Jakarta: Raja Grafindo Persada
- Mayer, R. E. (2009). *Multimedia Learning*. Cambridge: Cambridge University Press.
- Prastowo, A. (2016). *Panduan Kreatif Membuat Media Pembelajaran*. Yogyakarta: DIVA Press
- Tarmizi, M. (2019). *Implementasi Teknologi dalam Pembelajaran di Sekolah Dasar*. *Jurnal Teknologi Pendidikan*, 12(1)
- Arsyad, A. (2017). *Media Pembelajaran*. Jakarta: Raja Grafindo Persada.
- Mayer, R. E. (2009). *Multimedia Learning*. Cambridge: Cambridge University Press.
- Prastowo, A. (2016). *Panduan Kreatif Membuat Media Pembelajaran*. Yogyakarta: DIVA Press
- Setiawan, A. (2021). *Pengaruh Media Pembelajaran Digital terhadap Hasil Belajar Matematika Siswa SD*. *Jurnal Pendidikan*, 17(2)
- Tarmizi, M. (2019). *Implementasi Teknologi dalam Pembelajaran di Sekolah Dasar*. *Jurnal Teknologi Pendidikan*, 12(1)
- Creswell, J. W. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Boston: Pearson Education.
- Nunnally, J. C., & Bernstein, I. H. (2010). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill. (hlm. 264)

Field, A. (2013). *Discovering Statistics Using SPSS* (4th ed.). London: SAGE Publications.