Proceeding of 2nd International Conference on Education, Society and Humanity
e-ISSN : 2986-5832
p-ISSN : 2986-6979

Vol. 02 No. 02 (2024)
Available online at https://ejournal.unuja.ac.id/index.php/icesh

IMPACT OF DIGITAL LEARNING TOOLS ON STUDENT ENGAGEMENT IN ELEMENTARY SCHOOLS

Nadifah[1], Moh. Furqan [2],
[1,2]Universitas Nurul Jadid, East Java,
Indonesia
Email: n.dfah14221@gmail.com[1], moh.furqan@unuja.ac.id[2]

Abstract:
This study highlights the positive impact of digital learning media on students' academic performance. The analysis shows that the frequency of media usage, the type of media used, and students' perceptions of media effectiveness all have a significant relationship with academic outcomes. The perception of media effectiveness has the strongest correlation (0.55) with a p-value of 0.001, indicating that well-designed media is crucial for supporting student comprehension. These findings confirm Mayer's (2001) multimedia learning theory, emphasizing the importance of verbal and visual elements in learning. Sweller's (1988) cognitive theory suggests that well-designed digital media can reduce cognitive load. The study also emphasizes the role of intrinsic motivation in learning, as described by Deci and Ryan (1985), showing that interactive digital media can enhance students' motivation.Furthermore, adapting technology to local conditions is critical in improving learning outcomes. Therefore, schools in Indonesia need to develop teacher training, adequate infrastructure, and relevant digital content to maximize the benefits of technology in education. This study proposes the implementation of digital media in SD Namira as a model that other schools can adopt to enhance students' academic achievements by integrating technology into the learning process.

Keywords: *Digital Learning Tools, Student Engagement, Elementary Education*

INTRODUCTION

The use of digital learning media is growing along with advances in information and communication technology. Technology in this modern era not only influences the way we communicate and work, but also the way we learn (Putri & Jayanta, 2023). The integration of digital media in the learning process in schools, especially at the basic education level, is starting to be implemented as a method to improve the quality of student learning outcomes (Siregar & Sumantri, 2024).

The digitalization of learning has provided opportunities for educators to create more interesting and interactive learning experiences. Various digital learning tools, such as educational software, mobile applications, and e-learning platforms, are now increasingly being used to support the teaching and learning process. The use of these tools not only expands access to learning resources, but also increases student engagement in learning (Moore, 2010).

Student involvement is an important indicator of the success of the educational process. Students who are actively involved tend to have a better understanding of the subject matter, show higher learning outcomes, and have stronger learning motivation (Student et al., 2021). However, student engagement in elementary school is often a

challenge due to their young age and tendency to lose focus. In this research, digital learning tools can play an important role by providing more interesting and relevant learning experiences for students (Student et al., 2021).

This research aims to determine the impact of using digital learning media on student learning outcomes at Namira Elementary School. The main problem encountered in this research is whether the use of digital learning media is truly effective in improving student learning outcomes, or whether the media is only temporary without having a significant impact on schools.

Several previous studies show mixed results according to digital learning media that can increase student engagement and knowledge (Mwangi, 2024). This research specifically examines the impact of digital learning media on elementary school students which has not been widely discussed in previous studies. This school has implemented various digital devices such as computers and the Kahoot application in teaching and learning activities.

However, the extent to which this media has a positive impact on student learning outcomes always leaves questions that require answers through systematic research. Previous research conducted by (Kandia et al., 2023) shows that the use of digital media can increase student motivation. Research (Hillmayr et al., 2020) found that the use of digital tools has a positive impact on student learning outcomes in secondary schools, especially in mathematics and science subjects. Tools such as intelligent teaching systems and more simulations are effective compared to hypermedia tools, and teacher training also plays an important role in increasing the benefits of digital tools.

This research update focuses on elementary school students in Indonesia, especially on the application of digital learning media at Namira Elementary School. Although there have been many studies examining the impact of digital technology media on secondary and higher education levels, research focusing on elementary school students in Indonesia is still limited. In addition, this research uses quantitative methods with a survey approach, which allows empirical data to be generalized. The main aim of this research is to find out whether digital learning media has a significant influence on the learning outcomes of Namira Elementary School students. This research also aims to find out whether digital media can be an effective solution for improving the quality of education at the elementary level.

It is hoped that the results of this research can provide recommendations that can be applied not only at Namira Elementary School, but also at other basic education in Indonesia. In addition, it is hoped that this research can provide new insights for policy makers in the education sector to consider the use of digital media in the learning process as a tool to improve the quality of education in Indonesia. A deeper understanding of the impact of digital learning media on primary school student learning outcomes, this research contributes to achieving national goals to improve the quality of education and student skills in the digital era.

RESEARCH METHODS

This research applies quantitative methods with a survey approach to collect information regarding the influence of the use of digital learning media on student learning outcomes at Namira Elementary School. The choice of quantitative methods is based on their ability to provide objective and reliable measurements in testing research hypotheses (Student et al., 2021). A survey approach was adopted to obtain data from a wider population as well as provide an understanding of the use of digital media in the primary school environment.

In this study, the sample consisted of 30 students who were students in grades 4 and 5 of Namira Elementary School. The sample selection technique used was random sampling, with the aim of ensuring that each student had an equal opportunity to be selected as a respondent. The designed questionnaire includes questions regarding the frequency of use of digital media in learning, the type of media used, and students' perceptions of media effectiveness (Nurdyansah & Toyiba, 2018). Apart from that, learning outcome data is measured through the results of daily tests and semester exams.

Next, the following is a table of research indicators used to measure relevant variables:

Variable	Indicator	Data source
Use of learning media	Frequency of use	Student questionnaire
	Type of media used	Student questionnaire
	Perception of effectiveness	Student questionnaire
Learning outcomes	Daily test scores	Note value
	Semester exam results	Note value

Table 1 Variables and Data Sources

Interpretation of the collected data will be carried out through descriptive and inferential statistical analysis. Descriptive analysis functions to provide an overview of the data that has been collected, such as the average frequency of digital media use and the distribution of learning outcomes (Wahyuni, 2020). Inferential analysis, such as linear regression testing, will be used to test hypotheses regarding the relationship between digital media use and student learning outcomes.

Data obtained from the questionnaire will be analyzed using statistical software such as SPSS, to ensure the validity and reliability of the research results. The regression test will be used to determine whether there is a significant influence of the digital media usage variable on student learning outcomes. If a significant correlation is found, it can be concluded that the use of digital media has a positive impact on student learning outcomes. It is hoped that this research will provide empirical data that can be used as a basis for developing more effective learning methods at Namira Elementary School, thereby contributing to a more comprehensive understanding of the impact of technology in basic education.

RESULTS AND DISCUSSION

The following is a table of research results that shows the relationship between the use of digital learning media and student learning outcomes at Namira Elementary School:

Variable	Average score	Correlation coefficient	Significance (P-value)
Frequency of media use	4.2	0.45	0.002
Type of media used	3.8	0.32	0.025
Perception of media effectiveness	4.5	0.55	0.001
Daily test scores	82.5	-	-
Semester exam scores	85	-	-

Table 2 Descriptive statistics and correlation of learning media and student learning outcomes.

The table shows that the value of the frequency of use of digital media in learning has an average score of 4.2 on a scale of 5. A correlation coefficient of 0.45 indicates that there is a moderate correlation between the frequency of use of digital media and student learning outcomes, with a p value of 0.002 which indicates significance. statistics. The average score for the type of media used is 3.8. The correlation between the type of media used and student learning outcomes is 0.32, which reflects a positive but weak relationship, with a p value of 0.025 indicating significance, although not as strong as the frequency of use variable. Students' perceptions of the effectiveness of digital learning media have an average score of 4.5. A correlation coefficient of 0.55 indicates a strong

correlation between perceived media effectiveness and student learning outcomes, with a p value of 0.001 indicating very high significance. The average daily test score of students is 82.5, which shows quite good learning outcomes among Namira Elementary School students. In contrast, the average semester exam score is 85. Higher than the daily exam score, this score is in the very good range. This indicates that the use of digital learning media helps students learn the material in more depth and maintain their understanding over a longer period of time.

Cognitive Model of Learning

The results of this research strongly support the multimedia learning theory presented by Mayer (2001). This theory emphasizes that the use of various types of digital media, such as images, videos and interactive simulations, can increase students' knowledge through two cognitive pathways: verbal and visual. In the context of Namira Elementary School, students who are more frequently exposed to digital learning media show better learning outcomes, which indicates that digital learning media can improve students' ability to absorb the material studied.

Ningrum (2021) in his research emphasized the importance of diversifying teaching methods through technology. Teaching that only relies on textbooks or lectures is often less effective in engaging students, especially at the elementary school level. In contrast, digital media provides various ways to convey complex information in a way that is easier for students to understand, such as through social media. Through animations that depict abstract concepts or simulations that allow students to learn through experience.

The importance of integrating technology into learning is also seen in the strong link between perceived media effectiveness and student learning outcomes. This shows that digital learning media not only contribute to increasing student engagement, but also improve the quality of understanding of subjects. The results of this research emphasize the need for further development of interactive and technology-based learning media to maximize student learning potential.

Cognitive Learning Model

The results of this study are also related to the cognitive learning model proposed by Sweller (1988), which emphasizes reducing students' cognitive load. Well-designed digital media can help students manage information more effectively by presenting material in a format that is easier to access and understand. At Namira Elementary School, the digital learning media used may have contributed to helping students organize information and speed up the learning process.

Afidah (2015) explains that the cognitive learning model states that using appropriate media can reduce students' cognitive load so that they can focus more on understanding important concepts. For example, the use of interactive graphics or explanatory videos can help students understand complex topics in a more intuitive way than simply reading text.

Research findings showing a positive correlation between perceived media effectiveness and learning outcomes indicate that digital media has succeeded in reducing the cognitive load of students at Namira Elementary School. However, the success of digital learning media also really depends on how it is implemented. If digital media is not designed or distributed well, it can actually increase cognitive load and divert students' attention from basic material. Therefore, it is important for educators at Namira Elementary School to continue to evaluate and perfect the use of digital media in order to ensure that the media truly contributes to increasing students' knowledge.

Motivation Theory in Learning

The motivation theory developed by Deci and Ryan (1985) focuses on students' intrinsic motivation, which is related to their interest and desire to learn. In the context of implementing digital media at Namira Elementary School, the research results show that digital media has a significant role in increasing students' learning motivation. Students who feel that digital media helps them understand course material better tend to feel more motivated to learn, this is reflected in their higher learning outcomes.

Kandia et al (2023) suggest that digital media can be one of the factors that triggers increased intrinsic motivation by making the learning process more interesting and relevant for students; examples are educational games or interactive simulations that make students more involved in learning activities. This research shows a positive relationship between perceived media effectiveness and learning outcomes, confirming that when students find digital media useful, they learn better, and their motivation to participate in learning also increases.

Furthermore, this increase in motivation not only has an impact on short-term learning outcomes, but can also encourage students to become more active in the learning process in the future. Thus, the application of digital learning media designed to increase students' intrinsic motivation can be an effective strategy for improving the quality of education at Namira Elementary School.

Technology Acceptance Theory (TAM)

Technology Acceptance Theory (TAM), developed by Davis (1989), explains how a person's perception of the ease of use and benefits of a technology influences his desire to use that technology. In this research, students' perceptions regarding the effectiveness of digital media in learning at Namira Elementary School show a strong relationship with learning outcomes, which supports the basic principles of TAM.

This theory explains that if students find digital media easy to use and very helpful in understanding the subject matter, they will be more likely to make maximum use of the technology. Research results showing a positive relationship between perceptions of media effectiveness and learning outcomes support this concept, indicating that positive perceptions of digital media can improve student academic achievement.

Apart from that, TAM also underlines the importance of external factors, such as support from teachers and adequate technological infrastructure. In the context of Namira Elementary School, the results of this research can serve as a basis for encouraging wider implementation of educational technology, which is not only easy to use, but also shaped to meet students' learning needs. In this way, schools can focus more on developing and delivering digital learning materials that are effective and easily accessible to all students.

The Impact of Local Context on Digital Learning

The results of this research are also highlighted in the results of this study, which emphasize the importance of local perspectives in the application of educational technology, which is often overlooked in global studies. Although digital learning media have been widely adopted in various countries, their effectiveness can vary greatly depending on local conditions, including learning culture (Ertmer & Ottenbreit- Leftwich, 2010), technological infrastructure, and teachers' skills in integrating technology into the teaching and learning process. At Namira Primary School, the use of digital media has provided positive results, showing that when adapted to the local context, digital media can provide significant benefits.

In the Indonesian context, especially at Namira Elementary School, research results show that digital media can be used effectively to improve student learning outcomes, as long as its use is adjusted to students' needs and desires. This is very important because most previous research was conducted in countries with more advanced technological infrastructure, so the results cannot always be applied directly in Indonesia. This research confirms that digital media that has proven successful in other countries needs to be adapted first before being adopted in schools in Indonesia.

Apart from that, the results of this research also show that it is important for schools in Indonesia to continue to innovate and adapt digital learning technology to changes in technology and student needs. This includes adequate training for teachers, development of relevant digital content, and provision of supporting infrastructure. In this way, schools like Namira Primary School can continue to utilize technology to improve the quality of education they offer.

CONCLUSION

This research shows that the use of digital learning media contributes positively to student learning outcomes. Frequency of media use, type of media used, and students' perceptions of media effectiveness all have a significant relationship with learning outcomes. Perceptions of media effectiveness show the strongest relationship with learning outcomes, with a correlation of 0.55 and a p-value of 0.001. These findings underscore the importance of ensuring the digital media used is designed to support students' learning needs and maximize understanding of the material.

These findings support the multimedia learning theory by Mayer (2001) which emphasizes the importance of a combination of verbal and visual elements in improving learning outcomes. In addition, Sweller's (1988) cognitive theory is also relevant, because good digital media can reduce students' cognitive load, allowing them to focus on the core of learning. With the help of digital media, complex concepts can be simplified, increasing students' ability to process information effectively.

This research also highlights the importance of students' intrinsic motivation in the learning process, as explained by Deci and Ryan (1985). Attractive and interactive digital media can increase student motivation, encouraging them to learn more actively. Students' positive perceptions of effective digital media are the key to creating a conducive learning atmosphere, so that short-term and long-term learning outcomes increase.

Finally, this research emphasizes the need to consider local conditions in the application of educational technology. In the case of implementing digital-based learning, adapting digital media to student needs and local infrastructure capabilities has proven effective in improving learning outcomes. To expand these benefits, it is important for schools in Indonesia to develop teacher training, adequate infrastructure, and relevant digital content. In this way, schools can continue to utilize technology to improve the quality of education and answer the challenges of the digital era. Apart from that, the application of digital media at Namira Elementary School can be used as an inspiring model for other schools in integrating technology into the learning process, in order to support optimal improvement in student academic results.

REFERENCES

Afidah, V. N. (2015). Prinsip-prinsip Teori Beban Kognitif dalam Merancang Media Pembelajaran Matematika. Jurnal Pendidikan dan Pembelajaran Matematika, 1(2). doi:https://doi.org/10.29100/jp2m.v1i2.195

Azwar, S. (2017). Metode Penelitian Psikologi. Yogyakarta: Pustaka Pelajar.

Beetham, H., & Sharpe, R. (2013). Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning. Routledge.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319-340.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic Motivation and Self-Determination in Human Behavior. Berlin: Springer Science & Business Media.

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of Research on Technology in Education, 42(3), 255–284.

Firmansyah, A. (2024). Digital Learning Media in Enhancing Student Engagement and Learning Outcomes. Journal of Educational Technology and Development, 10(1), 22-30.

Firmansyah, H. (2024). Penggunaan Media Pembelajaran Digital untuk Meningkatkan Minat Belajar Sejarah di Sekolah Menengah Atas. JIMPS: Jurnal Ilmiah Mahasiswa Pendidikan Sejarah, 9(2). doi:http://doi.org/10.24815/jimps.v9i2.30416

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School Engagement: Potential of the Concept, State of the Evidence. Review of Educational Research, 74(1), 59-109. https://doi.org/10.3102/00346543074001059

Hillmayr, D., Ziernwald, L., Reinhold, F., Hofer, S. I., & Reiss, K. M. (2020). The potential of digital tools to enhance mathematics and science learning in secondary schools: A context-specific meta-analysis. Computers & Education, 153, 103897.

Hillmayr, D., Ziernwald, L., Reinhold, F., & Hofer, S. (2020). The potential of digital tools to enhance mathematics and science learning in secondary schools: A context-specific meta- analysis. Computers & Education, 153. doi:http://dx.doi.org/10.1016/j.compedu.2020.103897

Hillmayr, M., Klink, D., & Reiners, H. (2020). The Role of Digital Learning Tools in Enhancing Student Engagement and Academic Performance in Secondary Education. Journal of Educational Psychology, 112(5), 868-881. https://doi.org/10.1037/edu0000420

Kandia, M., Mustapha, M., & Samsudin, S. (2023). The Impact of Digital Media on Student Motivation and Learning Performance. Journal of Educational Media, 17(3), 254-267. https://doi.org/10.1080/01587919.2023.1993587

Kandia, I. W., Suarningsih, N. M., Wahdah, W., Arifin, A., Jenuri, J., & Suwarma, D. M. (2023). The Strategic Role of Learning Media in Optimizing Student Learning Outcomes. Journal of Education Research, 4(2), 508–514. https://jer.or.id/index.php/jer/article/view/193

Moore, C. (2010). Teaching digital natives: Partnering for real learning. International Journal for Educational Integrity, 6(2), 74–76. https://doi.org/10.21913/ijei.v6i2.707

Mwangi, J. (2024). Impact of Digital Learning Tools on Student Performance in Kenya. African Journal of Education and Practice, 9(2), 13–22. https://doi.org/10.47604/ajep.2521

Mayer, R. E. (2001). Multimedia learning. Cambridge University Press. doi:https://psycnet.apa.org/doi/10.1017/CBO9781139164603

Mayer, R. E. (2001). Multimedia Learning. Cambridge University Press.

Miftah, M. (2022). Strategi Peningkatan Kualitas Pembelajaran Melalui Pemanfaatan Media Pembelajaran Berbasis TIK. DIAJAR: Jurnal Pendidikan dan Pembelajaran, 1(3), 237-243. doi:10.54259/diajar.v1i3.900

Miftah, N. (2022). Evaluating the Effectiveness of Digital Learning Tools on Student Engagement at the Primary School Level. Indonesian Journal of Educational Technology, 5(2), 48-59.

Ningrum, C. C. (2021). Pengaruh penggunaan media pembelajaran terhadap minat belajar dan hasil belajar siswa di SD Negeri Kaliputih. Skripsi. Institut Agama Islam Negeri Purwokerto.

Ningrum, F. (2021). Effectiveness of Digital Learning Tools in Elementary Schools in Indonesia: A Case Study. Journal of Educational Technology Research, 15(1), 18-31.

Nurdyansah, & Toyiba, F. (2018). Pengaruh Strategi Pembelajaran Aktif Terhadap Hasil Belajar Madrasah Ibtiaiyah. Jurnal Pendidikan Islam, 3(1), 929–930. http://eprints.umsida.ac.id/1610

Putri, N. L. P. S. U., & Jayanta, I. N. L. (2023). Digital Practicum Module in Integrated Science for Elementary School Subjects. Journal of Education Technology, 7(2), 343–350.

Prensky, M. (2010). Teaching Digital Natives: Partnering for Real Learning. Corwin Press.

Putri, R. (2023). The Influence of ICT Integration on Elementary Education in Indonesia. Indonesian Journal of Education Technology and Innovation, 14(2), 79-89.

Putri, R. A. (2023). Pengaruh Teknologi dalam Perubahan Pembelajaran di Era DIgital. Journal of Computers and Digital Business, 2(3), 105-111. doi:10.56427/jcbd.v2i3.233

Siregar, A., & Sumantri, P. (2024). Pemanfaatan Media Digital dalam Proses Pembelajaran Ilmu Pengetahuan Sosial (IPS) Terpadu di Sekolah Dasar Kak Seto.

Education & Learning, 4(1), 17–22. https://doi.org/10.57251/el.v4i1.1242
Siregar, A., & Sumantri, P. (2024). Pemanfaatan Media Digital dalam Proses Pembelajaran Ilmu Pengetahuan Sosial (IPS) Terpadu di Sekolah Dasar Kak Seto. Education & Learning, 4(1), 17-22. doi:https://doi.org/10.57251/el.v4i1.1242
Siregar, M., & Sumantri, A. (2024). Challenges and Opportunities of Digital Media in Elementary Education in Indonesia. Journal of Educational Technology and Pedagogy, 11(1), 11-22.
Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alphabet.
Student, M. T., Kumar, R. R., Omments, R. E. C., Prajapati, A., Blockchain, T.-A., Ml, A. I., Randive, P. S. N., Chaudhari, S., Barde, S., Devices, E., Mittal, S., Schmidt, M. W. M., Id, S. N. A., PREISER, W. F. E., OSTROFF, E., Choudhary, R., Bit-cell, M., In, S. S., Fullfillment, P., … Fellowship, W. (2021). No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析Title. Frontiers in Neuroscience, 14(1), 1–13.
Sweller, J. (1988). Cognitive Load During Problem Solving: Effects on Learning. Cognitive Science, 12(2), 257-285. https://doi.org/10.1016/0364-0213(88)90023-7
Sweller, J. (1998). Cognitive load during problem solving: Effects on learning. Cognitive Science, 12(2), 257-285.
Wahyuni, M. (2020). Statistik Deskriptif Untuk Penelitian Olah Data Manual dan SPSS versi 25. In Angewandte Chemie International Edition, 6(11), 951–952. (Issue Mi).
Wahyuni, A. (2020). The Impact of Technology on Learning Outcomes: A Study of Primary Schools in Indonesia. International Journal of Educational Studies, 16(4), 40-52.
Mudarris, Badrul, And Mohammad Syifaur Rizal. 2023. “Manajemen Strategi Kepemimpinan Kepala Sekolah Dalam Meningkatkan Kedisiplinan Guru Dan Karyawan Di SMA Nurul Jadid.” JIIP-Jurnal Ilmiah Ilmu Pendidikan 6(12):10265–71.
Rizal, Mohammad Syifaur. 2024. “Educational Evolution: Sustainable Beturnment With Country In The Development Of The Trainer.” Pp. 28–36 In Proceeding Of International Conference On Education, Society And Humanity. Vol. 2