Mimbar PGSD Undiksha
Volume 11, Number 3, Tahun 2023, pp. 462-467
P-ISSN : 2614-4727, E-ISSN : 2614-4735
Open Access: https://doi.org/10.23887/jjpgsd.v11i3.64018

Improving Elementary School Students' Understanding of Literacy and Numeracy Through Digital Applications

Eviana Hikamudin[1*], Arie Rakhmat Riyadi[2], Aryanti[3], Dian Peniasiani[4], Pupun Nuryani[5], Ridwan Gofur[6]

[1,3,4,5] Pedagogy, Indonesian Education University, Bandung, Indonesia
[2] Primary School Teacher Education, Indonesian Education University, Bandung, Indonesia
[6] Guidance and Counselling, Indonesian Education University, Bandung, Indonesia

ARTICLE INFO

Article history:
Received June 20, 2023
Accepted October 10, 2023
Available online October 25, 2023

Kata Kunci:
Pembelajaran, Literasi Numerasi, Aplikasi Digital

Keywords:
Learning, Numeracy Literacy, Digital Applications

ABSTRAK

Tantangan perkembangan jaman menuntut individu memiliki kecakapan hidup yang adaptif. Kemampuan literasi dan numerasi merupakan dua kecakapan umum yang perlu dimiliki oleh siswa. Penelitian bertujuan untuk menganalisis tingkat pemahaman siswa Sekolah Dasar (SD) terhadap literasi dan numerasi melalui pemanfaatan aplikasi digital dalam pembelajaran. Pengumpulan data dilakukan melalui teknik survei menggunakan kuesioner, observasi, dan wawancara. Partisipan dalam penelitian ini adalah siswa kelas 4 (empat) SD berjumlah 177 orang, 4 guru, dan 2 kepala sekolah. Pengolahan dan analisis data menggunakan analisis kuantitatif deskriptif dengan menggabungkan hasil wawancara dan observasi menggunakan teknik comprehensive analysis. Hasil penelitian menunjukan pemahaman siswa terhadap materi literasi mencapai 39,32 dan materi numerasi mencapai 34,81. Pada aspek lainnya berdasarkan hasil observasi pelaksanaan pembelajaran diperoleh data bahwa 91% guru telah menyampaikan materi literasi dan numerasi dalam kategori baik. Berdasarkan hasil wawancara dan observasi lapangan, diperoleh data bahwa semua sekolah sampel telah memiliki program penguatan literasi dan numerasi dan melaksanakannya secara rutin di sekolah. Penguatan literasi dan numerasi menggunakan bantuan aplikasi digital dalam penilaian yang terdapat di sekolah saat ini belum mampu meningkatkan pemahaman siswa secara signifikan dalam literasi dan numerasi.

ABSTRACT

The challenges of changing times require individuals to have adaptive life skills. Literacy and numeracy skills are two general skills that students need to have. The research aims to analyze elementary school (SD) students' understanding of literacy and numeracy through the use of digital applications in learning. Data collection was carried out through survey techniques using questionnaires, observations, and interviews. The participants in this study were 177 grade 4 (four) elementary school students, four teachers, and two school principals. Processing and analysis of data using descriptive quantitative analysis by combining the results of interviews and observations using a comprehensive analysis technique. The results showed that students' understanding of literacy material reached 39.32, and numeration material reached 34.81. On other aspects, based on the observation of the implementation of learning, it was found that 91% of teachers had delivered literacy and numeracy material in the excellent category. Based on the interviews and field observations, data was obtained that all sample schools had literacy and numeracy strengthening programs and carried them out regularly at school. Strengthening literacy and numeracy using digital application assistance in assessments in schools is currently unable to increase students' understanding of literacy and numeracy significantly.

1. INTRODUCTION

Education in the 21st century emphasizes the process of increasing students' active role during the learning process, by developing various students' critical and creative thinking abilities. In order to create quality and highly competitive human resources, it is necessary to implement life skills development education through learning literacy, reading and numeracy as general skills, where these

Corresponding author
*E-mail addresses: evianahikamudin@upi.edu (Eviana Hikamudin)

skills must be possessed by every student. (Fauziah et al., 2022; Muliantara & Suarni, 2022).Reading literacy is not just the ability to read literally without knowing the content/meaning of the reading, but also the ability to understand the concept of reading (Shabrina, 2022; Ulfa et al., 2022). Meanwhile, numeracy is not just the ability to count, but rather the ability to apply the concept of counting in a context, both abstract and real (Azhari et al., 2022; Fauziah et al., 2022). With these literacy and numeracy skills, every student will be able to learn material more easily, besides these skills can help in solving problems encountered every day in their lives (Canhoto & Murphy, 2016; Triawang & Kurniawan, 2021).

Students as educational subjects have an important role in the educational process at school. Students, especially elementary school students, as students need to be given ample opportunities to increase their potential in learning, especially efforts to improve their understanding of literacy and numeracy (Perdana & Suswandari, 2021; Rohim & Rahmawati, 2020). Improving elementary school students' understanding of literacy and numeracy is an important strategy in efforts to prepare the quality of students at the next higher levels (Laksita & Mawardi, 2023; Salma, 2019).Literacy and numeracy learning for elementary school students needs to pay attention to the stages of children's development and the main tasks of development, namely the sense of accomplishment, namely the ability to complete tasks. (Ekowati et al., 2019; Perdana & Suswandari, 2021).During this period, children want to complete tasks consciously and independently, but on the other hand, children need to be conditioned so that they do not easily give up and give up. Therefore, children need to be exposed to challenging learning situations to think critically and creatively so that they become accustomed to solving problems that are considered more difficult. (Nur et al., 2020; Priyanto & Dharin, 2021).Literacy and numeracy learning will help teachers to familiarize students, especially elementary school students, with using their thinking potential to solve the challenges and problems they face. (Azhari et al., 2022; Ismafitri et al., 2022).

However, the reality in the field shows that not all students have good literacy and numeracy skills, this is indicated by the low interest in reading of students and the low critical thinking skills of students. The results of observations and interviews carried out with class IV students show that the level of students' literacy and numeracy skills is still in the low category, so they still need assistance and training. The low literacy and numeracy skills are caused by teachers not being able to provide opportunities for students to learn independently and develop their thinking abilities in the learning process. Apart from that, in the learning process teachers also do not utilize media that is appropriate to the needs and characteristics of students. Considering that literacy and numeracy skills are important for every student to have, there needs to be a systematic and planned effort from every educational practice to create learning that encourages students' literacy and numeracy abilities to be achieved. (Kumala et al., 2021; Musyafak & Agoestanto, 2022). One effort that can be made is for teachers to provide opportunities for students through learning to understand and master literacy and numeracy well. These efforts can be supported by the use of existing and rapidly developing information technology, one of which is by utilizing existing facilities in the form of digital-based learning or assessment applications.

Digital application media is digital-based learning media created through the use of internet and technology (Angriani et al., 2020; Fatmawati & Sholikin, 2019). Digital media generally contains various elements such as text, video, audio and animation, so it has attractive characteristics and is easy for students to use (Jannah & Atmojo, 2022; Saparuddin & Kaswar, 2022).Apart from that, digital media can also be used anywhere and at any time, making the learning process easier (Munawar et al., 2020; Novrianti, 2018).In the learning process digital media has several functions such as supplement functions, complement functions and substitution functions. These three functions then show that the use of digital media is not only sophisticated, but can also facilitate the implementation of a meaningful learning process. Several previous studies have revealed that the use of digital media in the learning process shows positive results in increasing students' literacy and numeracy skills. (Fisabillillah & Rahmadanik, 2022; Fitriyani et al., 2022; Hidayat & Fawaid, 2023). Other research results reveal that the use of digital media can significantly increase people's reading interest index (Ghofur & Rachma, 2019).Based on these results, it can be said that the use of digital media can significantly increase students' reading interest. It's just that in previous research, there have been no studies that specifically discuss the analysis of increasing elementary school students' understanding of literacy and numeracy through digital applications. So, this research focuses on this study with the aim of analyzing the level of understanding of elementary school (SD) students regarding literacy and numeracy through the use of digital applications in learning.

2. METHOD

This research is classified as a type of quantitative research which was carried out to obtain an overview of students' literacy and numeracy abilities through digital applications. Participants in this research were 177 grade 4 (four) elementary school students, 4 teachers and 2 school principals.

Research data was collected through surveys using questionnaires distributed directly and interviews with participants. Descriptive analytical methods are used in research to analyze two data sources, primary and secondary (Creswell & Creswell, 2018).The primary data source was obtained through the results of literacy and numeracy tests which were distributed to participants via questionnaires. Meanwhile, secondary data comes from information obtained from interviews with school principals and teachers, as well as observations of learning activities to improve literacy and numeracy.

The instruments in this research consisted of two types, namely a numeracy questionnaire totaling 18 questions and a literacy questionnaire totaling 17 questions. The numeracy questionnaire consists of various aspects including numbers - representations, numbers - operations, geometry and measurements - geometric shapes, geometry and measurements - measurements, and algebra - relations and functions. Meanwhile, the literacy questionnaire consists of three aspects, namely finding information - accessing and searching for information in the text, understanding - understanding the text literally, and understanding - making inferences, making connections and predictions in both single and plural texts. Data processing and analysis techniques use descriptive quantitative analysis by combining interview results and observation notes through comprehensive analysis (Creswell & Creswell, 2018).

3. RESULT AND DISCUSSION

Result

The research conducted literacy and numeracy tests on 177 elementary school students spread across eight schools. The research results show the average literacy and numeracy test scores which in Table 1.

Table 1. Student Literacy and Numeracy Test Results

No.	School	Average Literacy Score	Average Numeracy Value
1	SDN 006 BuahBatu	33.61	38.10
2	SDN 095 Babakanjati	28.64	30.43
3	SDN 131 Cijawura	35.29	27.04
4	SDN 184 BuahBatu	40.91	38.89
5	SDN 230 Margahayu Raya	33.22	30.39
6	SDN 242 Margasari	36.97	27.38
7	SDN 246 Margacinta	52.94	37.50
8	SDN 261 Margahayu Raya	44.34	44.34

Data in Table 1 shows that eight schools, Those who have been researched have carried out numeracy literacy learning using various practices and methods for each school, so that overall numeracy literacy has been carried out. However, there are still many obstacles in implementing numeracy literacy learning from each school, the problems that arise are almost the same on average. Based on the results of the interview with the school principal, it was revealed that there was still a lack of facilities for learning about numeracy literacy, especially numeracy literacy learning which relied on the technology and equipment owned by the school was relatively lacking. Apart from that, the results of interviews with teachers show that not all teachers understand numeracy literacy comprehensively, because teachers only understand literacy in a narrow sense limited to reading and arithmetic. This shows a lack of training or training workshops for teachers related to numeracy literacy, resulting in many teachers not understanding literacy fully and broadly. Furthermore, the results of interviews with students showed that the literacy and numeracy activities carried out were only limited to counting, they did not even know what the numeracy literacy learning was carried out for, numeracy literacy learning was only carried out conventionally through familiarization with reading and arithmetic.

In the literacy test results, the factors that influence the average score can be seen from how the learning process takes place. Digital learning is the most important component in implementing learning, so the use of media must be used as a part that integrates context in learning. Learning facilitators, especially teachers, must study and prepare regarding how to design and determine learning media, in order to make learning achievements more effective in schools. This prevents reasons due to limited time, media sources, and other reasons that hinder the learning process. To support this effort, teachers must have knowledge and skills regarding how to develop digital learning media. Digital literacy in schools needs to be encouraged from all aspects, both from the side of students and teachers as educators. Today's students can be called digital natives who are able to master technology without help from other people. Students may lack the critical skills necessary to evaluate information on the internet, while at the same

time they may avoid traditional media. Student involvement in the learning process is important to create a conducive learning climate.

Discussion

Based on the results of the data analysis that has been carried out, it can be seen that the level of literacy and numeracy activities has been carried out by all schools, but the programs carried out are still not running optimally. There are several factors that can influence low literacy and numeracy results, one of which is that there is still a view that children are smart at counting without knowing why they are learning this, they are considered to often read without knowing what use it is for everyday life, so that children learn without any meaning. clear and directed (Maxwell et al., 2017; Musoffa, 2022; Waldi et al., 2022). The application of numeracy literacy can be done anywhere, especially at school and home, such as reading food recipes, measuring each food ingredient, managing pocket money, measuring travel time, analyzing problems on social media and so on. (Canhoto & Murphy, 2016; Khasanah et al., 2021; Triawang & Kurniawan, 2021).In the implementation process, teachers have an important role in improving students' literacy and numeracy skills, where teachers are required to be able to create an interesting learning process through the use of digital learning media. (Azhari et al., 2022; Fauziah et al., 2022).

The learning process carried out involving digital media must pay attention to universal values such assafeguard privacy, expression, cultural diversity, intellectual rights, etc.Teachers also need to guide and teach the character values that students must have so that they have the character to be wise in using digital media (Perdana & Suswandari, 2021; Rohim & Rahmawati, 2020). Instilling and strengthening national character can be achieved well through digital literacy, because digital literacy allows teachers and students to access, sort and understand various types of information that can be used to improve the quality of life such as the health and parenting of children and families. (Ekowati et al., 2019; Perdana & Suswandari, 2021). The benefits of using digital learning media when viewed from its function are as follows: the first function is the supplement function, where in this function students are free to choose whether to use electronic learning media or not, so there is no coercion for students. The second function is the complement function, where learning will be programmed to complement students' learning material in class, as enrichment for students with average abilities and remedial for students with slow abilities. The third function is the substitution function, where various digital models are used in learning, so that students can choose and it will not affect the form of assessment, which means that all models get the same recognition or the same assessment. (Laksita & Mawardi, 2023; Salma, 2019). Several studies that have been carried out previously revealed thatThe use of digital media in the learning process shows positive results in increasing students' literacy and numeracy skills (Fisabillillah & Rahmadanik, 2022; Fitriyani et al., 2022; Hidayat & Fawaid, 2023). Other research results reveal that the use of digital media can significantly increase people's reading interest index (Ghofur & Rachma, 2019).Based on these results, it can be said that the use of digital media can significantly increase students' reading interest.

4. CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that students' low literacy skills can be improved through the application of digital media, this is because digital media can stimulate student motivation, because it is able to make students happy when facing learning at school.The application of digital media in developing literacy and numeracy skills is really needed by students, this is because digital media is able to provide various conveniences in the learning process.

5. REFERENCES

Angriani, AD, Kusumayanti, A., & Yuliany, N. (2020). Development of Digital Book Learning Media on Algebra Material. *Delta-Pi: Journal of Mathematics and Mathematics Education, 9*(2), 13–30. https://doi.org/10.33387/dpi.v9i2.2244.

Azhari, BM, Alifia Puteri, H., Azizah, I., Kamila, N., Azifatun Nazwa, H., & Andriatna, R. (2022). Efforts to Improve the Reading Literacy and Numeracy Skills of Elementary School Age Children in Jeron Village through Steam and Thinking Based Comic Worksheets. *To Maega: Journal of Community Service, 5*(2), 250. https://doi.org/10.35914/tomaega.v5i2.1058.

Canhoto, A.I., & Murphy, J. (2016). Learning From Simulation Design to Develop Better Experiential Learning Initiatives: An Integrative Approach. *Journal of Marketing Education, 38*(2). https://doi.org/10.1177/0273475316643746.

Creswell, W. J., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative and Mixed Methods Approaches. *Journal of Chemical Information and Modeling, 53*(9), 1–38.

https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf.
Ekowati, DW, Astuti, YP, Utami, IWP, Mukhlishina, I., & Suwandayani, BI (2019). Numeracy Literacy in Muhammadiyah Elementary Schools. *ELSE (Elementary School Education Journal): Journal of Elementary School Education and Learning, 3*(1), 93. https://doi.org/10.30651/else.v3i1.2541.
Fatmawati, NI, & Sholikin, A. (2019). Digital Literacy, Educating Children in the Digital Era for Millennial Parents. *Journal of Politics and Social Affairs, 11*(2). https://doi.org/10.52166/madani.v11i2.3267.
Fauziah, F., Firman, F., & Ahmad, R. (2022). The Role of Guidance and Counseling Teachers in Implementing the Independent Learning Curriculum. *Teacher Training: Journal of Research, Thought and Service, 10*(2), 53–56. https://jurnal.uisu.ac.id/index.php/Keguruan/article/view/6452.
Fisabillillah, Y., & Rahmadanik, D. (2022). Implementation of the Application of Literacy and Numeracy in the Class 3 Teaching Campus at SDN 1 Kedungkumpul, Sukorame, Lamongan Regency. *Community Development Journal: Journal of Community Service, 3*(2), 876–883. https://doi.org/10.31004/cdj.v3i2.4879.
Fitriyani, NN, Kusuma, RM, Supriadi, YN, Kusuma, JW, & Hamidah, H. (2022). PKM The Role of Teaching Campus Students 3 in Improving the Literacy and Numeracy of Students in Elementary Schools. *International Journal of Community Service Learning, 6*(2), 240–248. https://doi.org/10.23887/ijcsl.v6i2.51914.
Ghofur, A., & Rachma, EA (2019). Utilization of Digital Media on the Lamongan Regency Community Reading Interest Index. *Gulawentah: Journal of Social Studies, 4*(2), 89. https://doi.org/10.25273/gulawentah.v4i2.5524.
Hidayat, MNF, & Fawaid, A. (2023). PKM Improving Literacy, Numeracy and Technology Adaptation through the Teaching Campus Program at SMP Negeri 3 Pakuniran One Roof. *Journal of Community Engagement, 4*(1). https://doi.org/10.33650/guyub.v4i1.5928.
Ismafitri, R., Alfan, M., & Kusumaningrum, SR (2022). Characteristics of HOTS (High Order Thinking Skills) and Their Relationship with Numeracy Literacy Abilities in Elementary Schools. *Journal of Educational Intervention Research, 4*(1), 49–55. https://journal.rekarta.co.id/index.php/jrip/article/view/437.
Jannah, DRN, & Atmojo, IRW (2022). Digital Media in Empowering 21st Century Critical Thinking Skills in Science Learning in Elementary Schools. *Basicedu Journal, 6*(1), 1064–1074. https://doi.org/10.31004/basicedu.v6i1.2124.
Khasanah, F., Utami, RD, & Hartati, S. (2021). Application of Thematic Learning Based on Problem-Based Learning to Improve Learning Outcomes and Student Confidence. *Journal of Integrated Elementary Education, 1*(2). https://doi.org/10.21580/jieed.v1i2.9220.
Kumala, FN, Nita, CIR, Yasa, AD, Ghufron, A., Pujiastuti, P., & Rahayu, CP (2021). Digital Literacy Analysis of Elementary-School Students in Malang. Proceedings of the 2nd Annual Conference on Social Science and Humanities (ANCOSH 2020), 542. https://doi.org/10.2991/assehr.k.210413.030.
Laksita, A., & Mawardi, M. (2023). Evaluation of the School Literacy Movement Program in Elementary Schools. *Pulpit PGSD Undiksha, 11*(1), 110–120. https://doi.org/10.23887/jjpgsd.v11i1.42891.
Maxwell, S., Reynolds, K. J., Lee, E., Subasic, E., & Bromhead, D. (2017). The impact of school climate and school identification on academic achievement: Multilevel modeling with student and teacher data. *Frontiers in Psychology, 8*(1). https://doi.org/10.3389/fpsyg.2017.02069.
Muliantara, IK, & Suarni, NK (2022). Strategy to Strengthen Literacy and Numeracy to Support Independent Learning in Elementary Schools. *Educative: Journal of Educational Sciences, 4*(3). https://doi.org/10.31004/edukatif.v4i3.2847.
Munawar, B., Hasyim, AF, & Ma'arif, M. (2020). Digital Teaching Material Development Design Assisted by the Animaker Application. *Golden Age Journal, 4*(2), 310–320. https://doi.org/10.29408/goldenage.v4i02.2473.
Musoffa, M. (2022). Learning loss and decline in literacy and numeracy competency of elementary school (SD) students in Cikeusik sub-district, Pandeglang district, Banten. *Journal of Islamic Education, 1*(1). https://sinta.kemdikbud.go.id/journals/google/8211.
Musyafak, A., & Agoestanto, A. (2022). Development of Statistics Teaching Materials Containing Numeracy Literacy Questions with STEM Nuances to Improve Students' Critical Thinking Ability in PBL. *Tadris Journal of Mathematics, 5*(2), 273–284. https://doi.org/10.21274/jtm.2022.5.2.273-284.
Novrianti, NN (2018). Computer Based Learning E-Module as a Digital Literacy E-Resource for Students. *Journal of Educational Studies, 3*(1), 58. https://doi.org/10.30983/educative.v3i1.646.
Nur, L., Nurani, L.A., Suryana, D., & Ahmad, A. (2020). Rasch Model Application on Character Development Instrument for Elementary School Students. *International Journal of Learning, Teaching and*

Educational Research, 19(3), 437–459. https://doi.org/10.26803/ijlter.19.3.24.

Perdana, R., & Suswandari, M. (2021). Numeracy Literacy in Thematic Learning of Upper Grade Elementary School Students. *Abscissa: Mathematics Education Journal, 3*(1), 9. https://doi.org/10.32585/absis.v3i1.1385.

Priyanto, D., & Dharin, A. (2021). Students Creativity Development Model and Its Implementation in Indonesian Islamic Elementary School. *Pegem Egitim ve Ogretim Dergisi, 11*(3). https://www.pegegog.net/index.php/pegegog/article/view/1318.

Rohim, DC, & Rahmawati, S. (2020). The Role of Literacy in Increasing Students' Interest in Reading in Elementary Schools. *Basic Education Review Journal: Journal of Educational Studies and Research Results, 6*(3), 230–237. https://doi.org/10.26740/jrpd.v6n3.p230-237.

Salma, A. (2019). Analysis of the School Literacy Movement on Elementary School Students' Interest in Reading. *Pulpit PGSD Undiksha, 7*(2), 122–127. https://doi.org/10.23887/jjpgsd.v7i2.17555.

Saparuddin, S., & Kaswar, AB (2022). Training to Improve Skills in Making Microlearning Based Learning Videos using the Bandicam and Filmora Applications. *Sasambo: Jurnal Abdimas (Journal of Community Service), 4*(4), 638–647. https://doi.org/10.36312/sasambo.v4i4.924.

Shabrina, L.M. (2022). Campus Teaching Activities to Improve Literacy and Numeracy Skills of Elementary School Students. *Basicedu Journal, 6*(1), 916–924. https://doi.org/10.31004/basicedu.v6i1.2041.

Triawang, G., & Kurniawan, E. (2021). The Effect of Digital Literacy Towards the Selection of Social Science Teacher Learning Media. *Pegem Egitim ve Ogretim Dergisi, 11*(4). https://doi.org/10.47750/pegegog.11.04.30.

Ulfa, EM, Nuri, LN, Sari, AFP, Baryroh, F., Ridlo, ZR, & Wahyuni, S. (2022). Implementation of Game Based Learning to Improve Literacy and Numeracy Skills of Elementary School Students. *Basicedu Journal, 6*(6), 9344–9355. https://doi.org/10.31004/basicedu.v6i6.3742.

Waldi, A., Putri, NM, Indra, I., Ridalfich, V., Mulyani, D., & Mardianti, E. (2022). The Role of Teaching Campuses in Improving Literacy, Numeracy and Technology Adaptation of Elementary School Students in West Sumatra. *Journal of Civic Education, 5*(3). https://doi.org/10.24036/jce.v5i3.725.