

ANALYSIS OF THE NEED FOR DIGITAL TEACHING MATERIALS BASED ON MEANINGFUL LEARNING IN ELEMENTARY SCHOOLS

Ida Ayu Komang Tri Widia Utami¹, Kadek Hengki Primayana², I Nyoman Pancaria³

¹⁻³ Institut Agama Hindu Negeri Mpu Kuturan, Singaraja, Indonesia

Keywords:

digital teaching materials, meaningful learning, natural and social science learning

Corresponding authors email:

dayutrividia04@gmail.com

Abstract

This research is motivated by the importance of implementing meaningful Natural and Social Sciences learning in accordance with the demands of the Independent Curriculum, but the availability of teaching materials capable of encouraging active student engagement is still limited. This study aims to analyze the need to develop digital teaching materials based on meaningful learning in elementary schools. The study used a qualitative descriptive approach with data collection techniques in the form of observations and in-depth interviews with fourth-grade teachers in Cluster IV, Banjar District. The results show that Natural and Social Sciences learning has led to student engagement through exploratory activities. However, learning practices are still dominated by the use of textbooks and lecture methods, and the use of interactive digital teaching materials that can visualize concepts and relate material to students' real-life experiences is not optimal. This condition results in low learning interest and suboptimal student conceptual understanding. The implications of this research indicate that the development of digital teaching materials based on meaningful learning is a crucial need to improve the quality of Natural and Social Sciences learning, particularly in creating interactive, contextual, and meaningful learning experiences.

INTRODUCTION

Natural and Social Sciences is an integrated subject that integrates scientific, social, and cultural concepts to help students understand the environment comprehensively. At the elementary school level, Natural and Social Sciences plays a role in developing curiosity, practicing observation skills, and fostering concern for the environment and cultural diversity. The contextual nature of Natural and Social Sciences makes it relevant in building students' prior knowledge through meaningful learning oriented toward conceptual understanding (Evitasari Dwi, 2025).

In line with the implementation of the Independent Curriculum, learning in natural and social sciences is directed at strengthening competencies through student-centered, exploratory activities that relate to real-life contexts. Teachers are given the freedom to design learning experiences that encourage active participation, critical thinking, and the connection between concepts and everyday experiences. (Rahman & Fuad, 2023). However, in practice, learning natural and social sciences in elementary schools still faces various obstacles. The results of the 2022 PISA survey

indicate that Indonesian students' scientific literacy skills remain below the OECD average (Yanto et al., 2024). In addition, learning still tends to be dominated by lecture methods, memorization, and limited learning resources, so that it does not fully encourage in-depth conceptual understanding (Jannah, 2023). Field findings in Cluster IV, Banjar District, indicate that the teaching materials used are still dominated by textbooks and printed worksheets with limited visualization. This situation results in low learning interest, suboptimal student engagement, and a relatively shallow understanding of concepts. This indicates a gap between the demands of student-centered learning and the still-conventional learning practices.

To address these issues, innovation is needed in developing teaching materials that can increase engagement and the quality of learning. One potential alternative is digital teaching materials. Digital teaching materials enable multimodal presentation of material through text, images, audio, and video, and support more interactive and flexible learning (Farhana et al., 2024). The use of technology can also increase student participation and enrich the learning experience. (Nursekhah et al., 2025).

The development of digital teaching materials needs to be based on a meaningful learning approach, which emphasizes the connection between new knowledge and students' existing experiences. Ausubel's theory states that learning is more effective when new information is connected to existing cognitive structures, resulting in deeper and more lasting understanding. (Ausubel, 2013).

Based on the above description, this study focuses on analyzing the needs for developing digital teaching materials based on meaningful learning in natural and social sciences in elementary schools. The novelty of this research lies in providing empirical data on the actual needs of teachers and learning conditions in the field as a basis for developing digital teaching materials that are contextual, interactive, and appropriate to student characteristics. The results of this study are expected to contribute to improving the quality of natural and social sciences learning to be more relevant and meaningful.

METHOD

This study uses a qualitative descriptive approach to describe the need for meaningful learning-based digital teaching materials in elementary school science instruction. This approach was chosen because it provides a realistic picture of learning conditions and the needs of teachers and students without conducting treatments or experiments. Through this approach, researchers can directly observe classroom situations and understand how the learning process occurs in a real-world context.

The research was conducted in Cluster IV, Banjar District, involving fourth-grade teachers as the primary informants. Data were obtained through two techniques: observation and in-depth interviews. Observations were used to observe the natural and social science learning process, particularly regarding media use, student participation, and teacher strategies in linking material to real-life experiences. Interviews with fourth-grade teachers were conducted to obtain in-depth information regarding challenges faced, learning media needs, and teacher perceptions regarding the importance of digital teaching materials in supporting meaningful learning.

RESULTS AND DISCUSSION

The findings of this study indicate that the implementation of Natural and Social Sciences learning in Cluster IV, Banjar District, has begun to align with the principles of the Independent Curriculum, particularly in providing opportunities for students to explore their surrounding environment as a learning resource. Based on observations, teachers encourage student engagement through activities such as discussions, observations, and question-and-answer sessions linked to students' daily experiences. This condition reflects a positive shift in instructional practices, moving from teacher-centered approaches toward more student-centered learning. This finding is consistent with previous studies suggesting that contextual learning can enhance student engagement and active knowledge construction (Rahman & Fuad, 2023).

However, the findings also reveal that instructional innovation has not been fully optimized. The use of learning media and resources remains limited, with teaching materials still largely dominated by textbooks and printed worksheets. As a result, the presentation of learning content tends to be textual and less capable of providing diverse and meaningful learning experiences. This condition affects students' conceptual understanding, as the learning process does not yet fully support deeper knowledge construction. This finding is in line with (Jannah, 2023), who argues that the dominance of lecture-based methods and conventional teaching materials may hinder the development of students' conceptual understanding (Mayer, 2020).

The limited availability and use of digital teaching materials constitute a major challenge in the learning process. The study found that the existing media are insufficient to help students visualize natural phenomena, scientific processes, and socio-cultural diversity in a concrete manner. Consequently, students experience difficulties in understanding abstract concepts. This finding is supported by (Utami et al., 2021), who state that digital teaching materials with multimodal features—such as text, images, audio, and video—

can significantly improve students' conceptual understanding compared to printed materials.

Furthermore, interview results with fourth-grade teachers reinforce these findings. Teachers reported that one of the primary challenges in teaching Natural and Social Sciences is the limited availability of teaching materials that are appropriate for elementary school students' characteristics. Although the subject matter is closely related to students' daily lives, its presentation is often not engaging enough to stimulate curiosity. Teachers also noted that students tend to show greater enthusiasm when learning is supported by visual media such as images, videos, and animations. However, the limited availability of digital devices and teaching materials prevents the optimal implementation of such media. This condition highlights a gap between instructional needs and the availability of appropriate learning resources.

These findings support the concept of meaningful learning, which emphasizes the importance of connecting new knowledge with students' prior knowledge (Ausubel, 2013). Without adequate media support, learning tends to revert to rote memorization, reducing its meaningfulness. In addition, in the context of 21st-century learning, digital teaching materials play a crucial role in fostering critical thinking, collaboration, and reflective skills (Sari & Atmojo, 2021). Therefore, the lack of digital teaching materials not only affects student engagement but also limits the development of broader competencies.

Based on the research findings and supporting theoretical perspectives, the need for developing meaningful learning-based digital teaching materials in Natural and Social Sciences learning in Cluster IV, Banjar District, indicates a high level of urgency. Digital teaching materials designed in an interactive and contextual manner have the potential to enhance the quality of learning, both in terms of conceptual understanding and active student engagement.

CONCLUSION

The findings indicate that Natural and Social Sciences learning in elementary schools, particularly in Cluster IV, Banjar District, has begun to promote active student engagement through exploratory activities. However, the learning process remains dominated by printed teaching materials and conventional approaches, with limited use of digital teaching materials, which affects students' learning interest and conceptual understanding. These findings highlight that the development of meaningful learning-based digital teaching materials is essential to improve the quality of learning. Interactive and contextual materials have the potential to help students connect prior knowledge with new concepts more effectively. In the future, the development of digital teaching materials should be conducted systematically and supported

by further research to examine their effectiveness in improving learning outcomes.

REFERENCES

- Ausubel, B. B. (2013). *Belajar bermakna ausubel*. 43–48.
- Evitasari Dwi. (2025). *Pendekatan Pembelajaran Berbasis Deep Learning : Mindful Learning , Meaningful Learning , Dan Joyful Learning*. 08(April), 1–15. <https://e-jurnal.iainsorong.ac.id/index.php/Al-Mumtaz/article/view/1991>
- Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press. <https://doi.org/10.1017/9781316941355>
- Farhana, F., Suryadi, A., & Wicaksono, D. (2024). *Pengembangan Bahan Ajar Berbasis Digital Pada Mata Pelajaran Bahasa Inggris Di SMK Atlantis*. 3, 1–17. <https://doi.org/10.24853/instruksional.3.1.1-17>
- Jannah, M. (2023). *Studi Kasus Analisis Kesulitan Siswa dalam Pembelajaran IPS Kelas VI Sekolah Dasar*. 4(1), 32–42. doi: <https://doi.org/10.31332/dy.v4i1.5563>
- Nursekhah, M., Kusmana, S., Gloriani, Y., & Susilo, J. (2025). *Bahan Ajar Digital Teks Fabel Bermuatan Nilai-Nilai Karakter Untuk Siswa SMP / MTs*. 10(1), 30–41.
- Rahman, R., & Fuad, M. (2023). *Implementasi Kurikulum Merdeka Belajar Dalam Pembelajaran IPAS Di Sekolah Dasar*. 1, 75–80. <https://doi.org/10.26618/jrpd.v8i1.16681>
- Sari, F., & Atmojo, I. (2021). *Analisis Kebutuhan Bahan Ajar Digital Berbasis Flipbook untuk Memberdayakan Keterampilan Abad 21 Peserta Didik pada Pembelajaran IPA Sekolah Dasar*. 5(6), 6079–6085.
- Utami, N., Ragil, I., & Atmojo, W. (2021). *Analisis Kebutuhan Bahan Ajar Digital dalam Pembelajaran IPA di Sekolah Dasar*. 5(6), 6300–6306. <https://doi.org/10.31004/basicedu.v5i6.1716>
- Yanto, A. D., Rahaju, E. B., & Surabaya, U. N. (2024). *Literasi Matematika Peserta Didik SMP Berdasarkan Mathematics SelfEfficacy pada Masalah Statistika Adaptasi PISA*. 13(2), 660–673. <https://doi.org/10.26740/mathedunesa.v13n2.p660-673>