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Integration of Digital Technology in Thematic Learning in the Independent Curriculum in Elementary Schools

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ABSTRACT

In the 21st century, the use of technology in the learning process is no longer an option, but has become an obligation to improve the quality of education and form a generation that is able to adapt to the challenges of the global world. This study aims to analyze the integration of digital technology into thematic learning within the Merdeka Curriculum in elementary schools. The advancement of digital technology in the field of education demands learning innovations capable of improving the quality of the teaching and learning process. Digital technology serves not only as a tool but also as an integral part of creating interactive, adaptive, and student-centered learning. This aligns with the concept outlined in previous research, which emphasizes that the use of digital media can enhance 21st-century competencies and support the implementation of the Merdeka Curriculum. This study employs a qualitative approach using a literature review method. The findings indicate that the integration of digital technology into thematic learning is achieved through the utilization of various media, such as educational videos, digital platforms, and technology-based instructional materials. The use of these technologies is able to increase student engagement, motivation, and understanding of the learning material. This is also reinforced by findings in previous research, specifically the Digital Technology-Based Learning Models, which state that technology can create more meaningful and personalized learning experiences for students.

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1. INTRODUCTION

In the 21st century, the use of technology in the learning process is no longer an option, but has become an obligation to improve the quality of education and form a generation that is able to adapt to the challenges of the global world. The rapid advancement of technology has brought about major changes in various aspects of life, including the field of education. Education is an important part of a person's growth and development (Astuti & Putro, 2024:355). The Government of Indonesia through the

implementation of the Independent Curriculum learning will provide space for educational units to innovate learning activities that adapt to each student's needs, one of which is through the use of educational technology. Educational technology is present as an innovative solution to improve the quality of the teaching and learning process, expand access to education and adapt learning methods to the needs of today's digital generation. Participants are required to have good digital literacy skills, therefore the existence of technology in education is not only an option but also a necessity in the learning process.

The policy in the implementation of the independent curriculum is certainly referring to Permendikbud Ristek Number 5 of 2022 concerning graduate competency standards in Early Childhood Education, Primary Education, and Secondary Education; Permendikbud Ristek Number 7 of 2022 regarding content standards at the same level; Permendikbud Ristek Number 56 of 2022 concerning guidelines for the implementation of the curriculum in the context of learning recovery; and Decree of the Head of BSNP Number 008/H/KR/2022 of 2022 concerning learning outcomes in Early Childhood Education, Primary Education, and Secondary Education in the Independent Curriculum. Curriculum changes will be one of the solutions to improve the quality of education which is influenced by learning loss and increasing learning gaps (Susandi, et al., 2025:107). The independent curriculum can also be an alternative solution in overcoming the problem of losing the learning process due to the COVID-19 pandemic, namely by providing students with the freedom of "Freedom of Learning" in the implementation of the learning process inside and outside the classroom (Angga et al., 2023-1291). Changes in the curriculum need to be considered and understood by various parties, because the curriculum as a learning plan has a very important role and determines overall learning outcomes, both in the process and the results. (Mulyasa E, 2023:7). The Merdeka Curriculum emphasizes differentiated learning and provides a large space for the integration of educational technology, as both aim to create learning that is contextual, relevant and adaptive to the challenges of the times. The implementation of the independent curriculum at this time, especially in terms of technology integration, which is still a challenge with the rapid development of technology, digital tools in education should not only be used as a complement but must be an important part of the teaching and learning process (Nur, et al., 2025:16). Technology is an important tool to realize the vision of an independent curriculum that is in favor of students and prepare a superior generation in the digital era. Focus on students, and encourage the strengthening of personalities that are in line with the noble values of the nation. In this context, the value of Pancasila is the main basis in shaping the attitude and personality of citizens who have good character. The development of educational technology has opened up new opportunities in identifying and improving this problem (Khotimah & Sairah, 2023 -3584) Therefore, the application of technology in education not only aims to increase the effectiveness and ease of learning, but also becomes a strategic way to convey Pancasila values in a relevant way to the existing context.

Permendikbud RI No. 22 of 2020 concerning the Strategic Plan of the Ministry of Education and Culture for 2020-2024 explains that Indonesia also has an educational vision that reads "Realizing an advanced, sovereign, independent, and diverse Indonesia through the creation of Pancasila students". Therefore, Pancasila students are lifelong learners, meaning they have competence, character, and attitudes that are in accordance with the values of Pancasila itself. (Purnawanto 2022-79). Pancasila values are the foundation in all aspects of education, including the use of technology. However, challenges are still faced in implementing technology integration in an equitable and value-based manner. Not all educators have adequate technological competence, and not all digital learning content pays attention to aspects of character and national values. Based on this, this study seeks to examine how the integration of educational technology can be carried out within the framework of the Independent Curriculum based on Pancasila values, as well as identify opportunities and challenges in its application in educational units.

2. METHODS

This research uses a qualitative approach with the type of literature study research (library research). This approach is used to examine in depth the concept and implementation of the integration

of digital technology in thematic learning in the Independent Curriculum in elementary schools based on various relevant written sources. Qualitative research aims to understand the phenomenon in depth through descriptive analysis of the data obtained (Sugiyono, 2019). The data collection technique is carried out through literature studies, namely by collecting, reading, and reviewing various literature sources obtained from scientific databases such as Google Scholar, Garuda, and accredited national journals using keywords such as "digital technology in learning", "elementary school thematic learning", and "Independent Curriculum".

Furthermore, the data analysis technique used is content analysis, which is a technique used to draw conclusions from various written sources systematically and objectively (Krippendorff, 2018). The analysis process is carried out through several stages, namely identifying relevant information, grouping data based on the theme of discussion, comparing the results of previous research, and compiling a synthesis to draw comprehensive conclusions. The validity of the data in this study is carried out through the source triangulation technique, which is by comparing various references from relevant and credible scientific books and journals to ensure the validity of the data (Sugiyono, 2019). In addition, the researcher also ensures that the sources used are up-to-date and in accordance with the context of the research.

3. FINDINGS AND DISCUSSION

Implementation of Technology-Based Thematic Learning in Elementary Schools

The development of digital technology has brought major changes in the world of education. Therefore, the integration of technology in learning is no longer an option, but a need that must be applied optimally in the school environment. Good technology integration can help teachers create a learning process that is more interactive, innovative, effective, and in accordance with the needs of students in the digital era.

One of the important efforts in optimizing technology integration is to improve teachers' digital competence through training, workshops, seminars, and continuous professional development programs. Teachers are required not only to be able to use technological devices, but also to understand how this technology can be integrated with the right learning strategies and methods (Tambusai Education Journal, 2024).

Teachers' digital competence has a great influence on the success of technology-based learning because teachers are the main drivers in the educational process. In addition to improving teacher competence, schools must also provide adequate technological facilities and infrastructure, such as internet networks, computers, projectors, digital learning platforms, and other interactive media. The availability of good facilities will support teachers and students in carrying out more flexible and creative learning. Without adequate infrastructure support, the use of technology in education will experience various obstacles.

Technology integration also needs to be adjusted to the right pedagogical approach so that the use of technology is not just a tool, but is really able to improve the quality of learning (Journal of Basic Education Review, 2024). In this case, the concept of TPACK (Technological Pedagogical Content Knowledge) is one of the important frameworks (Journal of Education Research, 2024). This concept emphasizes that teachers must be able to combine technological knowledge, pedagogy, and learning materials in a balanced manner so that technology can be used effectively according to learning objectives (Journal of Information & Communication Technology in Education, 2023).

In addition, collaboration between schools, the government, and the community is also needed in supporting the digital transformation of education. The government can provide support in the form of policies, training, and assistance with technology facilities, while schools are responsible for implementing technology in a sustainable manner. With this collaboration, the integration of technology in learning is expected to be able to improve the quality of education and produce students who have the ability to think critically, creatively, communicatively, and adaptively to the development of the times (Manage: Journal of Education Management, 2024).

Based on the results of various studies, technology integration has been proven to be able to improve teachers' digital pedagogic competence and make the learning process more interesting and effective (Basicedu Journal, 2022). However, challenges such as limited internet access, lack of digital skills, and lack of technological facilities are still obstacles that need to be overcome together.

Digital technology plays a role in creating learning that is more interactive, flexible, and student-centered (Suryani, 2020; OECD, 2020)." In the context of thematic learning, the use of technology allows the integration of various subjects to be easier to understand through engaging and contextual media.

Thematic learning that integrates several subjects in one theme will be more effective if supported by digital technology, such as the use of learning videos, educational applications, and online learning platforms. Through the use of this technology, students not only receive information passively, but also actively engage in the learning process through exploratory activities, discussions, and digital-based projects. In addition, the integration of digital technology in thematic learning also contributes to the development of 21st-century skills, such as critical thinking, creativity, collaboration, and communication. The use of interactive digital media, such as online quizzes and learning simulations, can increase student participation and train their ability to solve problems independently or in groups. (Stuart O'Neill, 2025)

In this case, teachers have an important role as facilitators who are able to utilize digital technology effectively. Teachers not only deliver materials, but also design innovative learning experiences by integrating technology according to the needs and characteristics of elementary school students. Thus, thematic learning becomes more meaningful and relevant to the times. (Agus Dwi Prasojo, 2021).

The Concept of Digital Technology Integration in the Independent Curriculum

The Merdeka Curriculum emphasizes flexible, contextual, and student-centered learning. In its implementation, digital technology plays a role in creating learning that is more interactive, flexible, and student-centered (Suryani, 2020; OECD, 2020). Technology integration is not only limited to the use of devices, but also includes the use of learning platforms, educational applications, and interactive media that are able to improve the quality of the teaching and learning process (Basicedu Journal, 2024).

The integration of technology in the curriculum brings a significant transformation in the learning process that allows for wider and interactive access to materials. This makes the learning process more effective because of the ease of access to education.

With digital technology, the learning process can be adjusted to the needs and abilities of students. This is in line with the principle of differentiation in the Independent Curriculum, where each student has a different learning style (Indonesian Journal of Education and Technology, 2024). Therefore, digital technology is a strategic tool in creating more personalized and effective learning.

In addition to supporting differentiated learning, the integration of digital technology in the Independent Curriculum also helps teachers in carrying out learning assessments more effectively and efficiently. Teachers can use various digital platforms to evaluate learning, provide feedback quickly, and monitor student learning progress periodically (Obsession Journal,). Thus, the learning process becomes more measurable and in accordance with the needs of students.

The use of digital technology also supports the development of 21st century skills, such as critical thinking skills, creativity, communication, and collaboration. Through the use of digital media, students can access various learning resources independently, discuss online, and produce technology-based works (Jurnal Cakrawala Pendas, 2024). This is in line with the goals of the Independent Curriculum which seeks to create students who are independent, creative, and adaptive to the development of the times.

On the other hand, the integration of digital technology in education also faces various challenges, such as limited technological infrastructure, uneven internet access, and low digital competence of some educators (Journal of Education Research, 2024). Therefore, support from various parties, including the government, schools, and the community is needed in providing adequate facilities and training so that the implementation of technology in the Independent Curriculum can run optimally.

Strengthening digital literacy is also an important part of the application of technology in the Independent Curriculum. Digital literacy is not only related to the ability to use technological devices, but also the ability to understand, analyze, and use digital information wisely and responsibly (Journal of Educational Technology, 2024). With good digital literacy, students can use technology positively in supporting the learning process and daily life.

The Impact of Technology on Learning

The integration of digital technology in thematic learning has various positive impacts on the learning process in elementary schools. One of the most visible impacts is the increase in students' motivation and interest in learning. The use of technology-based learning media makes the learning atmosphere more interesting and not monotonous so that students are more active and enthusiastic in participating in learning activities. Digital media such as learning videos, animations, interactive quizzes, and educational games are able to create a fun learning atmosphere so that students can more easily understand the learning material delivered by the teacher (Wiryajati et al., 2022).

In addition to increasing learning motivation, the use of digital technology also has a positive impact on improving student learning outcomes. Learning materials that are presented visually and interactively are easier for students to understand compared to conventional learning methods that only focus on the teacher's explanation. The use of learning videos and interactive digital media helps students understand abstract learning concepts to become more concrete through images, animations, and simulations. This makes it easier for students to remember learning materials because they gain direct learning experience through digital media used in the learning process (Hanannika & Sukartono, 2022).

Digital technology also has a positive impact on the development of 21st century skills in students, such as critical thinking skills, creativity, communication, collaboration, and digital literacy. In technology-based learning, students are required to actively seek information, discuss, solve problems, and work together in developing learning projects. These activities indirectly help students develop critical and creative thinking skills in completing learning tasks. In addition, students also become more accustomed to using technology wisely and responsibly in supporting their learning process (Wicaksono et al., 2022).

The use of digital technology in thematic learning also supports the creation of more flexible and independent learning. Students can access learning materials anytime and anywhere through the digital learning platform used by teachers. This provides opportunities for students to learn according to their own speed and ability so that the learning process becomes more effective. Flexible learning is also very helpful for students in repeating material that has not yet been understood without having to rely entirely on the teacher's explanation in class (Rahayu et al., 2021).

In addition, the integration of digital technology also has a positive impact on strengthening the Pancasila Student Profile. Through project-based learning and the use of digital media, students can develop characters such as independence, responsibility, creativity, mutual cooperation, and the ability to work together. In technology-based learning activities, students are trained to complete tasks independently or in groups so that they learn to be responsible for the learning process and results carried out. Thus, the use of digital technology not only improves students' academic abilities, but also helps shape students' character in accordance with the goals of the Independent Curriculum (Kemendikbudristek, 2022).

Supplementation Challenges

Although the integration of digital technology provides many benefits in thematic learning, its implementation still faces various challenges that need to be considered. One of the main challenges is the limitation of technological facilities and infrastructure in elementary schools. Not all schools have adequate facilities, such as computers, laptops, projectors, internet networks, and other digital learning devices. This condition causes the implementation of digital technology to not be carried out optimally, especially in remote areas that still have limited access to technology and the internet (Hanannika & Sukartono, 2022).

In addition to limited facilities, the low digital competence of teachers is also one of the obstacles in the application of digital technology in thematic learning. There are still teachers who are not able to use learning applications and digital platforms to the fullest due to a lack of training and experience in utilizing educational technology. As a result, the use of technology in learning is sometimes limited to the use of simple media and has not been able to support the creation of innovative and interactive learning in accordance with the demands of the Independent Curriculum (Rahayu et al., 2021). Another challenge is the lack of digital learning media and content that matches the characteristics of elementary school students. Teachers need to adjust the use of technology to the level of development of students so that the learning media used really helps students understand the learning material. If the use of technology is not adjusted to the needs of students, then the learning process can actually become less effective and make students have difficulty understanding the material presented (Wicaksono et al., 2022).

In addition, the excessive use of digital technology can also have a negative impact on students if they are not under the supervision of teachers and parents. Continuous use of gadgets can cause students to become less focused, addicted to digital devices, and reduce social interaction with the surrounding environment. Therefore, the use of technology in learning needs to be controlled and directed so that it continues to provide positive benefits for the development of elementary school students (Dumako & Betrisandi, 2022).

The difference in students' ability to use technology is also a challenge in the implementation of digital-based learning. Not all students have the same experience and access to technological devices, so teachers need to adjust learning strategies so that all students can still follow learning well. With these challenges, the implementation of digital technology in thematic learning still requires attention and support from various parties so that its application can run more optimally and evenly in all elementary schools (Wiryajati et al., 2022).

Optimization Efforts

To overcome various challenges in the implementation of digital technology in thematic learning, various optimization efforts are needed that are carried out on an ongoing basis. One of the most important efforts is to improve teachers' digital competence through continuous training, workshops, seminars, and professional development programs. Teachers need to be equipped with the ability to use various learning applications, create attractive digital media, and integrate technology with the right learning strategies so that the learning process becomes more effective and innovative (Hanannika & Sukartono, 2022).

In addition to improving teacher competence, schools also need to provide adequate technological facilities and infrastructure to support the implementation of digital-based learning. The provision of internet networks, computers, LCD projectors, computer labs, and digital learning platforms are important factors in supporting the success of technology integration in elementary schools. With adequate facilities, teachers and students can carry out technology-based learning more optimally and effectively (Rahayu et al., 2021). The development of digital learning media that is creative and in accordance with the characteristics of elementary school students is also one of the important efforts in optimizing technology-based learning. Teachers can use learning videos, animations, educational games, interactive quizzes, and electronic LKPD to create a more fun and interesting learning atmosphere. Creative learning media can help students be more active in the learning process so that learning becomes more meaningful and not boring (Wicaksono et al., 2022).

Collaboration between schools, the government, and the community is also indispensable in supporting the digital transformation of education. The government can provide assistance with technology facilities, teacher training, and policies that support the implementation of digital technology in education. Schools are responsible for managing and utilizing technology facilities optimally, while the community and parents can support the positive use of technology in the home environment. With the cooperation of various parties, the implementation of digital technology in

thematic learning in elementary schools can run more effectively and evenly (Ministry of Education and Culture, 2022).

In addition, strengthening digital literacy for teachers and students also needs to continue to be carried out so that technology can be used wisely, safely, and responsibly. Digital literacy is not only related to the ability to use technological devices, but also the ability to understand, analyze, and utilize digital information positively. With good digital literacy, students can use technology to support the learning process and develop the skills needed in the 21st century. Therefore, optimizing the integration of digital technology in thematic learning is expected to improve the quality of education and create a learning process that is more innovative, effective, and in accordance with the times (Dumako & Betrisandi, 2022).

4. CONCLUSION

Based on the results of the literature review that has been conducted, it can be concluded that the integration of digital technology in thematic learning in the Independent Curriculum in elementary schools has an important role in improving the quality of the learning process. The use of digital technology is able to create learning that is more interactive, flexible, interesting, and student-centered. In addition, digital technology also supports the implementation of differentiated learning and makes it easier for teachers to deliver materials and learning assessments so that the learning process becomes more effective and in accordance with the needs of students.

The use of digital technology in learning also has a positive impact on increasing learning motivation, learning outcomes, and the development of 21st century skills in students, such as critical thinking skills, creativity, communication, collaboration, and digital literacy. The use of technology-based learning media, such as learning videos, animations, interactive quizzes, and digital platforms, helps students understand the material in a more concrete and fun way so that learning becomes more effective. However, the implementation of digital technology in thematic learning still faces various challenges, such as limited technological facilities and infrastructure, uneven internet access, low digital competence of teachers, and differences in students' ability to use technology. In addition, the uncontrolled use of technology can also have a negative impact on students if it is not accompanied by good supervision from teachers and parents.

Therefore, various optimization efforts are needed, such as improving teachers' digital competence through training, providing adequate technology facilities in schools, developing creative digital learning media, and strengthening cooperation between the government, schools, parents, and the community. With optimal support, the integration of digital technology is expected to improve the quality of education in elementary schools and support the effective achievement of the goals of the Independent Curriculum.

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