

THE POTENTIAL OF DIGITAL GAMES AS A MEDIUM FOR LEARNING PANCASILA AND CIVIC EDUCATION: EFFORTS TO BUILD ECOLOGICAL AWARENESS IN SUPPORT OF SUSTAINABLE DEVELOPMENT

POTENSI GAME DIGITAL SEBAGAI MEDIA PEMBELAJARAN PENDIDIKAN PANCASILA DAN KEWARGANEGARAN: UPAYA MEMBANGUN KESADARAN EKOLOGIS DALAM MENDUKUNG PEMBANGUNAN BERKELANJUTAN

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Abstract: the purpose of this study is to analyze students' views on the potential of digital games as a learning medium and the opportunities to use them to build ecological awareness in support of sustainable development. This study used a quantitative approach involving 196 high school students in Palangka Raya City. The results of the study show that 51 percent of students are interested in game-based learning, 73.5 percent of students say that games can be used as a means of delivering material, 77.6 percent of students have learned using games both formally and informally, and 87.8 percent of students are willing to try educational games for learning in the future. The use of digital games as a learning medium for Pancasila and citizenship education can shape students' ecological awareness in the context of sustainable development. Obstacles to implementing digital games as a learning medium to shape ecological awareness include low levels of teachers' digital literacy, limited school infrastructure, and limited availability of environment-based educational games.

Abstrak: tujuan kajian ini yaitu menganalisis pandangan siswa terhadap potensi game digital sebagai media pembelajaran serta peluang pemanfaatan game digital untuk membangun kesadaran ekologis dalam mendukung pembangunan berkelanjutan. Kajian ini menggunakan pendekatan kuantitatif dengan melibatkan 196 siswa sekolah menengah atas di Kota Palangka Raya. Hasil kajian menunjukkan bahwa sebanyak 51 persen siswa merasa tertarik dengan pembelajaran berbasis game, 73,5 persen siswa menyatakan game dapat digunakan sebagai sarana untuk menyampaikan materi, 77,6 persen siswa pernah belajar dengan menggunakan game baik secara formal maupun nonformal, serta 87,8 persen siswa bersedia mencoba game edukatif untuk pembelajaran di masa mendatang. Pemanfaatan game digital sebagai media pembelajaran pendidikan Pancasila dan kewarganegaraan dapat membentuk kesadaran ekologis siswa dalam konteks pembangunan berkelanjutan. Hambatan dalam implementasi game digital sebagai media pembelajaran untuk membentuk kesadaran ekologis yaitu tingkat literasi digital guru yang masih rendah, keterbatasan infrastruktur sekolah, serta minimnya ketersediaan game edukatif berbasis lingkungan.

INTRODUCTION

Games have become an integral part of the daily lives of the younger generation. Nearly every adolescent, particularly senior high school students, has access to digital devices and spends

leisure time playing games, whether in online or multiplayer environments or in simple casual games. This pattern indicates that games are no longer merely supplementary entertainment but have evolved into a defining element of the

digital generation's lifestyle. This phenomenon aligns with scholarly literature asserting that today's youth are digital natives, resulting in interactions with games that influence cognitive patterns and learning processes (Mertala et al., 2024). Similar findings are supported by Griffiths, emphasizing that intensive gaming among adolescents contributes to both social and cognitive development (Amaral & de Oliveira, 2021). This phenomenon warrants serious attention, as gaming activities can shape adolescents' patterns of interaction, thinking, and learning.

Games should not be perceived solely as distractions that undermine learning concentration, but rather as strategic opportunities that can be harnessed positively. Games intended for use as learning media must meet several essential criteria to support instructional processes effectively (Sutopo, 2020). Game content should incorporate educational material aligned with curricular objectives in order to stimulate students' critical and creative thinking skills. Games must be interactive, enabling active student participation through problem-solving and decision-making, while providing immediate feedback to reinforce conceptual understanding. Games, from a visual and auditory perspective, should present engaging designs that motivate students to remain focused and enthusiastic throughout the learning process. The interactive, visual, and challenging characteristics of digital games offer the potential to deliver learning experiences that are more engaging and relevant to students' real-world contexts (Gui et al., 2023; Gutierrez et al., 2023). Well-designed games can also be adapted to accommodate students' diverse learning needs and interests, thereby supporting personalized, flexible learning.

The use of digital games can enhance memory retention and conceptual understanding through repetitive, enjoyable learning experiences, while simultaneously providing opportunities for independent learning that can be accessed flexibly. The use of digital games as instructional media offers multiple advantages, not only increasing student motivation and engagement but also enriching conventional teaching methods through more innovative and effective approaches. These characteristics position digital games as a promising learning tool for optimizing

educational outcomes in modern education.

Digital games can serve as innovative learning media that foster students' critical thinking, collaboration, and creativity. Their utilization is also consistent with the characteristics of the digital generation, which tends to respond more positively to technology-based learning environments (Thomas, 2011). Serious games facilitate experiential learning, enhancing problem-solving abilities and creativity (Zairi et al., 2021). Educational games promote active student engagement through experiential learning, thereby enriching the overall learning process (Pacheco-Velazquez, Salinas-Navarro, & Ramirez-Montoya, 2023). The integration of digital games into educational settings thus holds strategic potential for creating participatory, contextual, and educationally relevant learning environments.

Twenty-first-century challenges require younger generations not only to master digital skills and academic knowledge but also to develop ecological awareness as responsible citizens. Climate change, air pollution, deforestation, and excessive energy consumption represent tangible global challenges that are increasingly complex and exert far-reaching impacts on human life. This condition is consistent with the principles of sustainable development articulated in the Sustainable Development Goals, particularly the objective of ensuring inclusive and equitable quality education while promoting knowledge and skills that support sustainable development. Education that integrates digital literacy with ecological awareness is essential as a foundational basis for enabling future generations to make informed decisions and to actively contribute to environmental preservation as well as sustainable economic and social development. Educational initiatives that promote digital literacy and sustainable development aim to foster a holistic approach to global challenges by synergistically integrating technological and environmental dimensions. Education serves not only to enhance intellectual capacity but also to foster character and cultivate critical awareness of environmental stewardship for future generations. These challenges cannot be addressed solely through government policies but require active societal participation, particularly from younger generations that will serve as future decision-makers.

Achieving the Sustainable Development Goals requires cross-sectoral collaboration to ensure inclusive access to education and equitable digital literacy training, thereby empowering communities to participate in sustainable development in a holistic and just manner. This approach represents a key strategy for addressing the complexity of global challenges and for cultivating technologically proficient, ecologically and socially conscious citizens. The education for sustainable development framework emphasizes that ecological awareness can only be effectively instilled through participatory educational practices that prioritize active student engagement. Early student involvement in environmental issues strengthens long-term ecological awareness (de la Fuente, 2021). Fostering ecological consciousness from an early age is imperative to ensure that younger generations can actively support sustainable development initiatives.

The integration of environmental education represents a critical strategy that can be implemented through the subject of Pancasila and civic education. Pancasila and civic education, which fundamentally instill values of Pancasila, democracy, and civic responsibility, offer substantial opportunities to cultivate ecological awareness (Nasir, 2022). Instruction emphasizes the interrelationship between citizens' rights and obligations as well as their responsibilities toward the environment. Students are equipped not only with cognitive knowledge but also guided toward internalizing environmentally responsible attitudes in their daily lives. Civic competence plays a vital role in shaping reflective, critical, and responsible citizens, including in relation to environmental issues (Tam, 2023). The integration of environmental education within Pancasila and civic education enhances students' ecological awareness while simultaneously reinforcing Pancasila values in civic practice (Nugroho, 2017). Pancasila and civic education serve as a strategic means of cultivating a generation with a strong national character while remaining oriented toward environmental sustainability. Based on this background, the present study examines students' perspectives on the potential of digital games as learning media to foster ecological awareness in support of sustainable development.

METHODS

This study employs a quantitative approach to describe trends, perceptions, and students' experiences in utilizing digital games as learning media. Data were collected by distributing questionnaires to 196 senior high school students in Palangka Raya City. The respondents were 40.8% male and 59.2% female students, providing a relatively balanced representation of perceptions by gender. The research instrument was a questionnaire designed to collect information on respondents' profiles; gaming habits, including duration, preferred game genres, and platforms used; students' attitudes toward educational games; and perceptions of the potential of digital games as learning media. Data analysis involved calculating the percentage distribution of respondents' answers for each questionnaire item. The quantitative findings were subsequently interpreted through the lenses of educational theory, civic education, and environmental education. The results provide empirical insights into the potential integration of digital games to support learning oriented toward sustainable development.

RESULTS AND DISCUSSION

Students' Level of Interest in Digital Games as Learning Media for Pancasila and Civic Education

The findings of this study indicate that the majority of students show a strong interest in gaming activities. Students reported that 95.9% enjoy playing games during their leisure time, whereas 4.1% expressed no interest in games. Games have become one of the most dominant forms of entertainment among adolescents and play a significant role in shaping patterns of social interaction in the digital era (Suplig, 2017). Students reported that 81.6% have favorite games, with most preferring online multiplayer games such as *Roblox*. This type of game not only provides entertainment but also creates broad opportunities for social interaction among players. Online multiplayer games can fulfill players' social needs through both collaboration and competition (Baltzar, Hassan, & Turunen, 2023). Students reported that 69.4% play online games frequently. Adolescents in many countries increasingly use online games as a primary means of socializing and building peer networks

(Esteves, Valogianni, & Greenhill, 2021). These data indicate that gaming is common and popular among adolescents and has become an integral part of their daily lives.

The high level of student interest in games can be understood from an educational psychology perspective. Self-determination theory holds that individuals' intrinsic motivation is strongly influenced by the fulfillment of three basic psychological needs, namely autonomy, competence, and relatedness (Deci & Ryan, 2002). Digital games generally facilitate the fulfillment of these three needs. Autonomy is reflected in players' freedom to choose strategies or gameplay approaches, competence emerges through challenges embedded in the game, and social relatedness is realized through interaction among players in multiplayer modes (Gupta & Goyal, 2022). Students' interest in games should not be regarded merely as a temporary trend, but rather as a phenomenon rooted in fundamental psychological needs and reinforced by broader global social developments. The role of games extends beyond entertainment to include fulfilling needs for autonomy, achievement, and social interaction, which are essential aspects of adolescent development. Understanding students' motivation for playing games represents an important initial step in exploring the broader potential of games both in recreational contexts and within future educational applications.

The results further demonstrate that students' interest in digital games is not limited to entertainment but has expanded into the domain of learning. Students reported that 51% expressed very high interest in game-based learning, while 77.6% had experienced learning through games in both formal and nonformal settings. These findings indicate that educational games are not unfamiliar to students. Students reported that 87.8% expressed willingness to try educational games in the future, reflecting a very high level of acceptance toward learning innovation. Students reported that 73.5% perceived games as tools that can be used to assess understanding of learning materials. This perception provides strong justification for viewing digital games as an alternative learning medium that aligns with the needs of the younger generation. Students perceived games as more interactive and enjoyable, which enhances learning motivation.

Student assessments also indicate that games can train important skills such as critical thinking, collaboration, problem-solving, and creativity. The use of games can facilitate understanding of learning materials and improve concentration during the learning process. The application of gamification in education has been shown to enhance intrinsic motivation and student engagement (Jusuf, 2016). Games function not only as entertainment media but also as transformative tools that improve the quality of learning.

The characteristics of digital games enable the presentation of simulations that resemble real-life situations, allowing students to learn through direct experience in deliberation, resource management, or public decision-making. Dale's cone of experience emphasizes that concrete experiences are more easily understood and remembered than abstract experiences (Stoma, Dudziak, & Spalek, 2019). Games provide active, participatory, and immersive learning experiences compared to conventional passive learning methods (Najuah, Sidiq, & Sinamora, 2022). Presenting learning experiences that closely approximate real-world conditions demonstrates games' capacity to bridge the gap between theory and practice.

The simulation-based and narrative-driven characteristics of digital games indicate substantial potential as a medium for enhancing students' civic competence. Twenty-first-century civic competence encompasses critical thinking, problem-solving, collaboration, and active participation in social life (Alscher, Ludewig, & McElvany, 2022). Serious games have been shown to improve students' analytical and problem-solving skills (Pacheco-Velazquez, Salinas-Navarro, & Ramirez-Montoya, 2023). Simulation-based games can foster collaborative attitudes and social skills among players (Bata, 2022). The findings of this study reinforce previous research emphasizing the significant potential of digital games as effective learning media. Students' positive responses to game-based learning indicate that integrating games into education has a strong empirical foundation. Game characteristics that combine entertainment, motivation, and learning elements can enhance students' interest in learning. The utilization of digital games as learning media offers a strategic

opportunity to create learning processes that are more interactive, meaningful, and aligned with the needs of the digital generation.

The Utilization of Digital Games as Learning Media to Foster Ecological Awareness

The implementation of digital games as learning media in Pancasila and civic education has demonstrated significant potential in enhancing students' motivation, engagement, and conceptual understanding. The use of educational game media, such as platforms like Educaplay and Wordwall, has contributed to making learning more innovative, varied, and engaging for students. The characteristics of digital games not only transform learning dynamics that were previously dominated by lecture-based and memorization-oriented methods into interactive, contextual, and meaningful learning experiences but also position students as active subjects directly involved in the process of knowledge construction. This learning approach not only improves cognitive outcomes but also supports the development of students' affective and social dimensions by reinforcing values such as tolerance, cooperation, democratic attitudes, and the internalization of moral and character values embedded in Pancasila. The use of digital game media further supports the development of students' digital literacy, an essential skill in the twenty-first century. Technical limitations do not diminish the relevance of digital game-based learning strategies as creative solutions to address learning challenges that require more engaging and meaningful approaches.

The use of digital games as learning media can also develop students' ecological intelligence. Digital games that employ interactive context-based approaches can present simulations of real-world situations related to environmental issues and sustainable development aligned with Pancasila values. This is evident in games that adopt environmental conservation themes such as forest management, pollution reduction, and natural resource conservation, which not only teach civic values normatively but also cultivate critical awareness and empathy toward ecosystem sustainability. Students are not only able to understand their rights and obligations as citizens but also to internalize ecological principles in their daily lives. The role of digital games as learning media in Pancasila and

civic education encourages the development of ecological intelligence that is essential for character formation and environmental responsibility. This role constitutes an integral component of the global objectives of civic education.

Digital games can provide learning experiences that embody the practice of ecological citizenship. The concept of ecological citizenship emphasizes that citizenship extends beyond political rights and obligations to include moral responsibility for environmental sustainability (Kasmawati, 2023). Examples of implementation may involve students' participation in virtual ecological missions such as pollution reduction, waste management, tree planting, or energy conservation. These virtual activities function not merely as entertainment but also as learning simulations that instill ecological responsibility as an integral aspect of citizenship. Education that integrates environmental issues can strengthen ecological awareness and increase students' participation in concrete actions oriented toward sustainability (Susanti & Rachmawati, 2018). Transformative learning theory explains that learning experiences capable of challenging existing perspectives can trigger critical reflection and encourage changes in awareness (Taylor & Cranton, 2023). The characteristics of digital games that focus on environmental issues enable the presentation of dilemmas such as choices between economic interests and ecosystem preservation or the consequences of consumptive lifestyles. Such learning experiences have the potential to transform students' perspectives on everyday practices and foster a commitment to adopting sustainable lifestyles. Participatory-based environmental education is more effective in shaping ecological awareness and behavior than traditional instructional approaches.

The use of digital games as learning media that integrate perspectives on ecological citizenship strengthens students' civic knowledge, civic skills, and civic dispositions. Serious games with environmental themes can enhance conceptual understanding while motivating students to engage in environmentally friendly actions in real life (Pacheco-Velazquez, Salinas-Navarro, & Ramirez-Montoya, 2023). Games serve as a form of transformative learning that enables students to support sustainable development actively. The development of students' ecological competencies

in support of sustainable development aligns with UNESCO's education for sustainable development framework. This framework emphasizes the importance of equipping students with sustainability competencies such as critical thinking, collaboration, and responsible decision-making (Machado & Davim, 2022). Pancasila and civic education occupy a strategic position in integrating the principles of education for sustainable development, as these subjects not only instill civic knowledge but also foster the internalization of Pancasila values. The value of cooperation embodied in the third principle and social justice reflected in the fifth principle can serve as normative foundations for the practice of ecological citizenship.

Educational games with environmentally themed narratives can serve as concrete instruments for strengthening the integration of education for sustainable development within Pancasila and civic education. Digital games based on education for sustainable development have been shown to enhance ecological awareness and improve students' collaborative skills (Chen & Ho, 2022; Gatti, Ulrich, & Seele, 2019; Ho et al., 2022; Zhang & Zeng, 2022). The integration of game-based learning increases student participation in environmental issues and reinforces understanding of Pancasila values (Yani, Parji, & Dewi, 2023). Simulations within games allow students to assume the role of citizens required to make decisions on environmental issues, such as resource management, pollution reduction, and the use of renewable energy. This approach supports students in understanding concepts cognitively while simultaneously internalizing sustainability values within a civic context.

The strategy for implementing digital games as learning media to develop ecological intelligence and support sustainable development must be structured and continuous. The initial stage involves planning by formulating learning objectives that integrate ecological aspects within the context of sustainable development. The planning process guides the development of digital game content that presents environmental issues, such as natural resource conservation, environmental governance, and social responsibility, in ways that foster environmentally conscious citizenship. Digital games serve not only as entertainment media but also as educational

tools that can deeply instill ecological and social values in students.

The design and production stage of games places interactivity and feedback as crucial elements. Games are designed to encourage students to think actively, make decisions, and experience the consequences of those decisions in the context of environmental preservation and sustainable development. The use of progressive levels, adaptive challenges, and collaborative elements increases motivation and engagement in the learning process. Immediate feedback provided within the game helps students understand both successful actions and mistakes, making the learning process more effective and reflective.

The implementation stage of digital games in Pancasila and civic education requires training and capacity-building support for teachers. Teachers' competence in effectively utilizing games constitutes a critical component of learning strategies oriented toward character development and ecological intelligence. Training materials include integrating game content with classroom discussions that address ecological values, civic ethics, and sustainable development issues. Continuous formative evaluation is also necessary to measure students' mastery of ecological competencies and to adjust learning strategies based on evaluation outcomes.

The monitoring and evaluation stage represents an essential component of the strategy for implementing digital games as learning media. Periodic evaluation enables objective measurement of the effectiveness of game utilization in developing ecological intelligence and supporting sustainable development. Evaluation results provide a basis for developers and teachers to revise content and learning methods to ensure relevance to developments in science and technology and to contemporary environmental issues. Opportunities for cross-disciplinary collaboration among educators, technology developers, and environmental communities can also be expanded to produce richer, more contextually relevant game content. The contribution of digital games as learning media is expected to foster a generation that is not only academically and digitally proficient but also possesses strong ecological awareness in support of sustainable development.

Implementing digital games as learning media faces several challenges. Diffusion of

innovations theory shows that the success of adopting educational innovations, including digital games, is influenced by perceived benefits, compatibility with needs, and ease of use (Yu, 2022). Teachers' readiness in digital literacy significantly affects the effectiveness of technology adoption in learning. Innovation cannot be optimally implemented without sufficient readiness, even if students respond positively (Septiana & Hanafi, 2022). The findings of this study indicate that students' interest in using educational games is relatively high, reflecting a strong relative advantage and compatibility. The primary obstacle remains teachers' limited digital literacy, which hinders the effective integration of games into learning.

Additional barriers to implementing digital games as learning media include limited school infrastructure and the scarcity of environmentally themed educational games. Conditions in several schools indicate that technological facilities and stable internet access remain inadequate, thereby constraining the widespread implementation of digital games. Infrastructure limitations and the lack of relevant digital content constitute major obstacles to the integration of information and communication technology in schools (Aang, Angin, & Anu, 2021). Collaboration among schools, government institutions, and technology developers represents a strategic step toward creating educational games that align with curriculum needs and environmental education objectives. Policy support, infrastructure provision, and the development of contextual local content demonstrate the considerable potential of digital games as innovative media for fostering ecological awareness among senior high school students.

CONCLUSION

Students demonstrate a relatively high level of interest in using digital games as learning media in Pancasila and civic education. Students reported that 51% are interested in game-based learning, 73.5% perceive games as effective tools for delivering learning materials, 77.6% have previously engaged in learning through games in either formal or nonformal contexts, and 87.8% express willingness to use educational games for learning purposes in the future. The utilization of digital games as learning media in Pancasila and civic education has the potential

to foster students' ecological awareness within the context of sustainable development. Digital games with environmentally themed narratives can be developed through platforms such as Educaplay and Wordwall to strengthen the integration of education for sustainable development. The development of digital games as learning media can be conducted through four main stages, namely planning, design and production, implementation, and monitoring and evaluation. The implementation of digital games as a learning medium to foster ecological awareness faces several challenges, including the relatively low level of teachers' digital literacy, limitations in school infrastructure, and the limited availability of environmentally themed educational games.

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