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The Effectiveness of 3D Sipaurangi Learning Media in Increasing Students' Self-efficacy

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Abstract. This study aimed to measure the effectiveness of using Sipaurangi 3D learning media in enhancing students' self-efficacy in the subject of Pancasila Education. The Sipaurangi 3D media was developed using the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation, to ensure that the product meets learning needs. This media was designed to integrate interactive elements that are concrete and engaging, thereby providing students with a more immersive learning experience and motivating them to become more active in the learning process. The study was conducted in Grade IV at SDI Gunung Sari Baru, Makassar City, using data collection methods such as questionnaires, observations, and learning achievement tests. The results showed that Sipaurangi 3D media significantly enhanced students' self-efficacy, as evidenced by an increase in self-efficacy questionnaire scores before and after using the media, with a significance value of ($p < 0.05$). In addition, students gave positive responses to this media, as demonstrated by their increased confidence and motivation in understanding the Pancasila Education material. Teachers also provided positive feedback, stating that this media is practical and effective in capturing students' attention and increasing their participation during the learning process. Thus, Sipaurangi 3D learning media can be proposed as an innovative alternative to improve the quality of learning and student engagement in the teaching-learning process, particularly in subjects that focus on character building and the reinforcement of national values.

Keywords: *Learning Media; 3D Sipaurangi; Self-efficac; Pancasila Education; Elementary School*

INTRODUCTION

Education plays a strategic role in building a nation that is characterized, knowledgeable, and innovative. As the main pillar in shaping the younger generation, education in Indonesia integrates Pancasila Education as part of efforts to foster national awareness, mutual cooperation, and social justice (Bransford et al., 2020; Ayubi, 2024; Suardi, 2023). However, the implementation of this subject faces complex challenges, especially in terms of teaching methods that are often considered monotonous. This has a negative impact on student engagement and their ability to comprehend the material being taught (Heinich et al., 2017).

As one of the factors influencing learning, students' confidence in their own abilities (self-efficacy) is an essential element in educational success. According to Bandura (1997), this concept refers to an individual's belief in their capacity to complete specific tasks. Students with high self-efficacy levels tend to be more motivated, persistent, and achieve better learning outcomes (Zimmerman & Martinez-Pons, 1990). Therefore, improving self-efficacy becomes a priority in the education process, including through the development of innovative learning media that

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can stimulate students' interest and learning motivation (Akhir, 2024).

Traditional teaching methods are often inadequate to meet the needs of students born in the digital era. A lack of interaction and active engagement are among the causes of low student motivation. This condition is further exacerbated by the use of conventional learning media that are less appealing, making learning passive and unmotivating for students (Muhtadi et al., 2022). Additionally, studies show that limitations in pedagogical approaches can reduce students' confidence in facing academic challenges (Valentina et al., 2023). Innovations in learning media, such as augmented reality and 3D-based media, offer great potential to enhance student engagement. These media enable students to interact directly with learning materials, creating a more meaningful and interactive learning experience (Gagné et al., 2018; Mayer, 2020). For example, research by Jannah and Kurniawan (2024) showed that the use of augmented reality-based flashcards could improve students' understanding of difficult material, while Carolina (2023) found that augmented reality was effective in increasing the learning motivation of digital-native students.

The Sipaurangi 3D media was designed as a solution to overcome challenges in teaching Pancasila Education. This media combines interactive visual elements with three- dimensional technology, creating an immersive and enjoyable learning experience for students. Through this media, students can better understand Pancasila values by connecting abstract concepts to concrete visualizations that reinforce their comprehension.

The effectiveness of Sipaurangi 3D media in improving students' self-efficacy is supported by relevant theories and research. For instance, Mayer (2020) found that well-designed interactive multimedia can enhance understanding and information retention. Meanwhile, Pertiwi et al. (2022) revealed that problem-solving-based media could improve students' abilities to overcome challenges, which directly impacts their self-efficacy.

Research on self-efficacy indicates that students who have high confidence in their abilities are better equipped to face academic challenges with confidence (Mustadi et al., 2023). The Sipaurangi 3D media aims to create a supportive learning environment where students can visualize their progress and receive constructive feedback. This aligns with the findings of Muhtadi et al. (2022), which highlighted that supportive learning environments can improve students' perceptions of their abilities.

In addition to improving self-efficacy, this media is also expected to enhance students' learning motivation. Valentina et al. (2023) stated that learning motivation is

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influenced by students' perceptions of the success they can achieve. By using engaging 3D media, students are more encouraged to actively participate in learning, thereby increasing their intrinsic motivation.

The development of innovative learning media such as Sipaurangi 3D is a crucial step in improving the quality of education in Indonesia, particularly in Pancasila Education. This media not only helps students better understand the nation's fundamental values but also enhances their self-efficacy and learning motivation. Thus, the use of this media can make a significant contribution to creating a young generation that is both characterized and highly competitive.

Further research is recommended to explore the effectiveness of Sipaurangi 3D media in various other learning contexts and to measure its long-term impact on students' learning outcomes. With the right approach, technology-based learning media can become a powerful tool to transform education in this digital era.

RESEARCH METHODS

This study employed a research and development (R&D) methodology using the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Reigeluth, 2013). The ADDIE model was chosen for its systematic structure and stages in the development of educational products. The following is an explanation of each stage:

1. **Analysis**: In this stage, a needs analysis was conducted to understand the students' conditions and the challenges they faced in learning Pancasila Education. The analysis revealed low student participation and the need for more engaging learning media (Bates, 2019).
2. **Design**: Based on the analysis, the Sipaurangi 3D learning media was designed. This media was developed as an interactive box consisting of five sides, each presenting a different educational game. These games were designed to strengthen the concepts in Pancasila Education and to encourage student engagement (Smith & Ragan, 2019).
3. **Development**: At this stage, the Sipaurangi 3D media was developed and validated by media and subject matter experts. Validation results indicated that the media had an excellent level of validity, with a score of 96.42% from subject matter experts and 96.71% from media experts (Dick et al., 2021).
4. **Implementation**: The Sipaurangi 3D media was implemented in the learning process for fourth-grade students at SDI Gunung Sari Baru, Makassar. Students were divided into small groups to use the media during learning activities. This research site was chosen due to its representative classroom conditions and

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the ease of access for researchers to conduct observations and collect data (Kouzes & Posner, 2017).

5. **Evaluation**: The evaluation stage was conducted to measure the effectiveness of the media in improving students' self-efficacy. Data were collected using questionnaires, observations, and learning outcome tests. The research instruments included a self-efficacy questionnaire to measure students' confidence levels, an observation sheet to record students' participation during learning activities, and a learning outcome test to assess their understanding of the material (Jonassen, 2017). The evaluation results showed a significant increase in students' self-efficacy after using this media.

DISCUSSION

The research findings indicate that the Sipaurangi 3D media successfully improved students' self-efficacy significantly. Based on observations and questionnaires, students demonstrated an increased belief in their ability to understand Pancasila Education materials. For instance, previous studies have emphasized the importance of self-efficacy as a key factor in learning success (Zimmerman & Martinez-Pons, 1990). In this context, the use of interactive, technology-based media has proven effective in boosting students' confidence in their abilities, as evidenced by Muhtadi et al. (2022), who found that innovative approaches enhanced students' mathematical skills.

Additionally, the results of the paired samples test showed a significance value ($p < 0.05$), indicating a significant difference in students' self-efficacy before and after using the Sipaurangi 3D media. Similar findings were reported by Hidayatullah and Setiyawan (2024), who highlighted that students' confidence in their abilities can be strengthened through well-designed learning strategies. This study also supports Valentina et al. (2023), who showed that technology-based interventions improved students' well-being and self-efficacy during the pandemic.

Furthermore, questionnaire results revealed that 85% of students felt more confident in understanding the material after using Sipaurangi 3D. Students stated that this media made learning more enjoyable and less monotonous (Clark & Mayer, 2016). Positive responses were also observed in the classroom, where students actively asked questions, answered inquiries, and participated in group discussions. Teachers noted an overall increase in student participation, particularly among previously less active students (Anderson & Krathwohl, 2019). These findings align with Mustadi et al. (2023), who stated that students' self-efficacy could be enhanced through interactive technology- based learning. Similar results were reported by Lai et al. (2021), who found that integrating

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technology into the learning process positively impacted students' satisfaction and academic performance.

From a local perspective, Valentina et al. (2023) emphasized the importance of student-centered approaches in improving self-efficacy during the pandemic, which also applies to the use of interactive media like Sipaurangi 3D. These results are consistent with Susanto et al. (2023), who highlighted that family support and interactive media can enhance the quality of home-based learning.

Teachers' responses to this media were also highly positive. They stated that the media was practical to use and successfully captured students' attention, making them more active in the learning process (Gagné et al., 2018). Students felt more confident in participating in learning activities, especially when they successfully completed tasks assigned through this media. This is supported by studies showing that increased student confidence is closely related to the effectiveness of innovative learning media (Mustadi et al., 2023). Students' confidence in learning was also found to correlate with emotional engagement and learning satisfaction, as discussed by Lai et al. (2021). Furthermore, Valentina et al. (2023) argued that students' self-efficacy could be enhanced through meaningful learning experiences supported by relevant media, ultimately contributing to their psychological well-being. Other studies, such as Muhtadi et al. (2022), demonstrated that self-efficacy plays an important role in improving students' abilities, particularly in mathematics, which can be extended to the application of interactive learning media. In the context of Indonesian education, Fitriyana et al. (2021) revealed that innovative learning media, such as game-based hybrid learning, is effective in enhancing self-efficacy, independent learning, and student learning outcomes. Therefore, the use of this media not only supports academic achievement but also positively impacts students' emotional and psychosocial skill development (Hidayatullah & Setiyawan, 2024).

Evaluation of the use of Sipaurangi 3D media also revealed that students with initially low self-efficacy experienced significant improvements, enabling them to better address learning challenges (Bates, 2019). Similar findings were reported by Valentina et al. (2023), who found that increased self-efficacy in students correlated with better learning outcomes. Other studies also revealed that the effectiveness of technology-based learning media could significantly enhance students' self-efficacy (Muhtadi et al., 2022).

Sipaurangi 3D media successfully created a more collaborative learning environment where students worked together in groups to complete challenges presented by the media. This collaboration strengthened

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their ability to support one another, thereby improving self-efficacy, as supported by Vygotsky's theory of social learning (Vygotsky, 2019). This was reinforced by Susanto et al. (2023), who demonstrated that family support and collaboration could enhance self-efficacy in learning environments during social restrictions caused by the pandemic.

Moreover, research by Mustadi et al. (2023) highlighted that motivation and self-efficacy are critical factors in educational success. In the context of Sipaurangi 3D media, less confident students became more willing to participate as they felt supported by their peers. This finding aligns with Muhtadi et al. (2022), who found that students' self-efficacy could be enhanced through effective group-based learning, particularly in mathematics. Thus, Sipaurangi 3D media not only serves as a tool for individual learning but also fosters a sense of community and mutual trust among students.

A study by Jannah and Kurniawan (2024) supports these findings, where the use of augmented reality-based media also showed significant improvements in students' self-efficacy in learning. This aligns with Valentina et al. (2023), who demonstrated that innovative, technology-based approaches positively impacted well-being and self-efficacy, especially during challenging pandemic situations. Like augmented reality media, Sipaurangi 3D provides a more interactive and engaging learning experience, which ultimately enhances students' motivation and confidence. This corresponds with Mustadi et al. (2023), who emphasized the role of motivation and self-efficacy in improving learning performance.

understanding and motivation. This is further supported by Hidayatullah and Setiyawan (2024), who found that students' confidence in mathematics could be strengthened through adaptive, technology-based learning strategies. Thus, Sipaurangi 3D media not only improves learning outcomes but also provides an enjoyable experience that motivates students to continue learning. Family support and student collaboration, as shown in Susanto et al. (2023), further strengthen the positive effects of this media on students' self-efficacy.

CONCLUSION

Based on the research findings, the Sipaurangi 3D learning media is effective in enhancing students' self-efficacy in the Pancasila Education subject. This media successfully increases student engagement in the learning process and provides a more engaging and meaningful learning experience. With this media, students become more confident, motivated, and active in learning activities. Furthermore, Sipaurangi 3D encourages collaboration among students, strengthening the social aspects of learning and fostering a sense of togetherness among

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them. Teachers' responses also indicated that this media is practical and effective in increasing student participation. Although there are some challenges, such as time limitations and the need for adaptation, this media remains highly viable for further development and broader implementation to improve the quality of learning in elementary schools.

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