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Augmented Reality as a Cultural Bridge: Promoting Pancasila Values through Local Wisdom and AR-Based Learning Media

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Abstract AR media links real and digital worlds ahead of classroom walls, leading to educational innovation. This study develops the board game Yojo in the Kaili Land, an AR-based learning media, to enhance students' comprehension of Pancasila values (Indonesia's foundational state ideology comprising five core principles that underpin civic life and national identity), which is based on one of the local wisdoms of the Kaili Tribe. This board game was created based on the ADDIE approach which consists of five main elements: analysis, design, development, implementation, and evaluation. The effect of the board game was validated using interviews with five experts and teachers. Findings indicated that Yojo in the Kaili Land conforms to Merdeka Curriculum and provides interesting learning for the users. The Yojo in the Kaili Land board game can be developed further as a learning media which is innovative and interactive and supports the local culture through the adaptation of digital technology to enrich the quality of Civics learning in the digital era.

Keywords: *Augmented reality, Cultural identity, Local wisdom, Civic values, Digital literacy*

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1. Introduction

Pancasila is the main ideology for national life in Indonesia, not only as a political principle, but also as a reflection of cultural identity, ethical values, and national character (Nuraedah & Saefudin, 2024; Utomo et al., 2024). In the midst of rapid globalization and the penetration of digital technology, instilling the values of Pancasila in the younger generation has become an increasingly real challenge. Many students struggle to understand the meaning of these noble values in their daily lives, especially when taught through conventional and abstract approaches (Firmansyah et al., 2024; Nur Hakim et al., 2024; Oktaviani et al., 2024; Siswanto et al., 2024). However, in this digital age, digital literacy can serve as a crucial bridge. As students become increasingly accustomed to the digital environment, the teaching of values must also become more interactive, contextual, and closely tied to their daily lives.

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Teachers of Pancasila and Citizenship Education play an important role in helping students understand the learning material, build national values, and face the challenges ahead (Ande et al., 2025; Hung et al., 2025). Teaching has to be changed in order to fit in a digital atmosphere; otherwise, attracting the new generation to learning will be impossible (Lah et al., 2024). The advancement of technology has dramatically transformed the way students receive and process information, which takes place globally, flexibly, and is not bound to a traditional classroom (Kobayashi et al., 2025). Therefore, the traditional learning system must be revitalised and made more relevant in the face of challenges in contemporary life (Saefudin et al., 2024; Samaden, Ahmad, & Salam, 2025). The use of technology in education, particularly digital-based learning media, has supported flexible and interactive learning (Samaden, Ahmad, Salam, et al., 2025; Xiong et al., 2021; Yung & Khoo-Lattimore, 2019). Nowadays, information and communication technology, such as radio, television, computers, the internet, and mobile phones, is embedded in life and learning (Kobayashi et al., 2025). The effect of these technologies on education can be classified into substitution, intermission, and transformation (Azizoon et al., 2025). In the substitution period, technology is used only as a medium, yet the method of teaching does not differ. But in the transition and transformation stages, Information and Communication Technology (ICT) in learning is becoming included to help the move to more creative and context-driven learning.

Augmented Reality (AR) is a novelty technology that allows the overlaying of digital content on the real world, making the learning experience more interactive, contextual, and immersive (Cipresso et al., 2018; Ibanez & Delgado-Kloos, 2018; Li et al., 2018; Shafique et al., 2020; Yu et al., 2019). The technology lets people interact with enhanced physical environments embedded with video, sound, graphics, or other data via TVs or even walls. There is a large educational potential of AR for the better understanding of abstract objects, along with the provision of visual and contextual information (Azizoon et al., 2025). Existing studies have increasingly popularized the use of AR in learning (Garcia-Garcia et al., 2018; Moro et al., 2017), particularly with the emergence of mobile augmented reality that enables students to access content through mobile devices anywhere at any time (Cipresso et al., 2018; Ibanez & Delgado-Kloos, 2018; Li et al., 2018). Other research showed the potential of the AR to explore the learning process independently and to motivate students in the learning process (Huffer & Oxenham, 2015; Pantazidou, 2025; Türkoğlu, 2019). Other studies also show that at the national level, the presence of AR in education can elevate the values of Pancasila, as an awareness of unity and diversity through more innovative learning experiences that are represented in local wisdom (Firmansyah et al., 2024; Nur Hakim et al., 2024; Oktaviani et al., 2024; Siswanto et al., 2024). Thus, AR is a new tool of learning that develops the ability to inculcate national values in a more relevant and contextual way.

In this study, AR technology is utilized to develop the *Yojo in the Kaili Land* board game and teach the Pancasila values of the local wisdom of the Kaili Tribe. The word for boy in the Kaili language is ‘yojo’. This term is widely used in the cultural context of the Kaili tribe in Palu, Central Sulawesi (Nuraedah & Saefudin, 2024; Utomo et al., 2024). Within the framework of this research, Yojo represents the young generation who get to be educated in the values of Pancasila and local wisdom through interactive games. This initiative aligns with the Merdeka Curriculum, which emphasizes student-centered, context-based learning that encourages exploration of local culture and the development of character and civic values. The board game (Yojo in the Kaili Land with QR code technology integrated with AR) that uses this AR technology, students can find multimedia (text, audio, and animation) as a form of learning, which is the meaning of the symbol of Pancasila, which is in everyday life. The AR technology employed in Yojo in the Kaili Land functions as an educational medium to embody the compound of game-oriented and culture-based learning, realizing the educational technology that is both situational and novel. Therefore, this study tried to design an AR-based board game, Yojo in the Kaili Land, as interactive learning media to increase understanding of learning concepts about Pancasila values and the local wisdom of the Kaili Tribe.

2. Theoretical Framework

In this section, we will further discuss the merging of the game-based learning media and local wisdom as a media contextual approach to develop the internalization of Pancasila values.

2.1. Game-Based Learning Media and Local Culture

The implementation of game-based learning media in the form of board games and interactive applications to develop character and national values among students is an innovative effort. In addition to fun and competition, these media also provide interactive learning and emotional engagement of students (Saefudin et al., 2024; Samaden, Ahmad, & Salam, 2025). By engaging students in learning games, they are challenged to connect ideas, collaborate, and feel values more viscerally through lived experience.

The application of the learning media design that uses local cultural elements can reinforce the relevance of the content and enhance students' affinity towards the noble values of the country. Local wisdom in education is a national identity strengthener that can build up the students' nationalism and social empathy (Cipresso et al., 2018; Ibanez & Delgado-Kloos, 2018; Li et al., 2018). This is also consistent with the guiding principle of the Merdeka Curriculum for the students to learn contextually in their social and cultural environment. Through games that uplift local stories, symbols, or philosophy, value and moral learning could be experienced actively, reflectively, and collaboratively. In the realm of education of Pancasila, the game-based method seems relevant since it can bring the abstract values into concreteness by social simulation (Lah et al., 2024). The creation of game-based and local culture-based educational media not only helps fun learning, but also triggers an internalization of Pancasila values in a more meaningful and applicable sense.

2.2. Augmented Reality in Education

AR is a medium in which virtual objects, text, images, animations, etc., are integrated with the real world interactively and in real time (Samaden, Ahmad, Salam, et al., 2025; Xiong et al., 2021; Yung & Khoo-Lattimore, 2019). By placing digital objects in the physical context, AR offers a more authentic and immersive learning experience (Huffer & Oxenham, 2015; Pantazidou, 2025; Türkoğlu, 2019). This technology enables an interactive and exciting learning environment in which learners are not merely the passive recipients of information, but participants as well who can explore knowledge. In schools, AR has been applied to the visualisation of abstract ideas to make them appear more concrete and less complex, especially in science, mathematics, and social science (Cipresso et al., 2018; Ibanez & Delgado-Kloos, 2018; Li et al., 2018; Shafique et al., 2020; Yu et al., 2019).

Several studies suggest that emotional engagement, learning motivation, and concept grasping can be heightened when we use AR in learning through the manipulation of materials with context and interactive exposure. A study has confirmed that the adoption of AR in science textbooks can successfully stimulate students' interest to learn (Firmansyah et al., 2024; Nur Hakim et al., 2024; Oktaviani et al., 2024; Siswanto et al., 2024). Moreover, another research study concluded that AR can enhance students' problem-solving abilities as well as spatial understanding in mathematics education (Azizoon et al., 2025). Given these advantages, AR is seen as a possible solution to addressing the problems of 21st-century learning, particularly in providing a fun, interactive, and meaningful learning experience for the digital generation of young people today.

2.3. AR for Value Learning and Strengthening Digital Literacy

The combination of AR technology in value-added educational media presents a great potential to present material in a more relevant and contextualised way. AR makes the students learn through the experience of direct interaction with visual and audio content, which is projected into the real world, so delivery of values and the character of the nation is more tangible and fun (Nuraedah & Saefudin, 2024; Utomo et al., 2024). Such learning experiences can enhance students' cognitive and affective engagement and support the process of internalising the values communicated. In addition, research shows that AR-based digital media can encourage students' literacy and numeracy development, and support 21st-century skills such as critical thinking, collaboration, and problem solving (Kobayashi et al., 2025). In the context of basic education, the use of AR is proven to improve the ability to understand complex and abstract information while building students' interest in the subject matter. Thus, AR not only enriches the method of value delivery but also strengthens the digital literacy dimension as an important foundation in modern education.

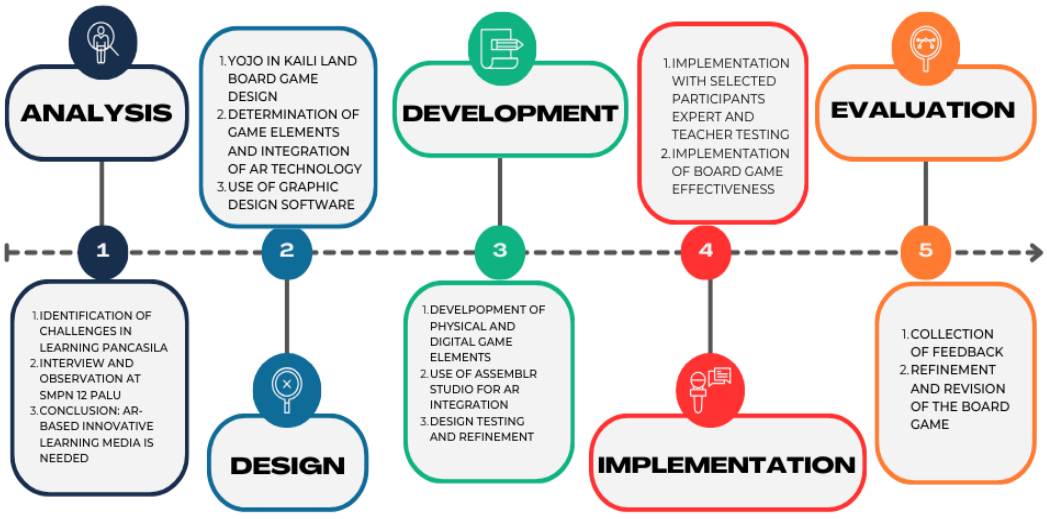
Based on the literature review, it appears that the integration of AR technology in game-based learning media and local culture has not been thoroughly explored, especially in the context of Pancasila value education at the junior high school level. Therefore, this research aims to address this gap by developing and evaluating the Yojo in the Kaili Land application as an innovative, contextual, and fun alternative to educational media.

3. Methodology

3.1. Design

This research uses the ADDIE model to systematically develop the Yojo in the Kaili Land board game (Azizoon et al., 2025; Koderi et al., 2023). The ADDIE instructional design model is made up of five parts: analysis, design, development, implementation, and evaluation. This model-oriented approach contributes to an organized development process. The model is chosen for its maintainability of the mode of repetition, where the stages are interconnected and revisable. Therefore, when a phase does not go as expected, that phase can be reiterated until the research objectives are achieved (Azizoon et al., 2025; Koderi et al., 2023). The ADDIE model involved in the board game design is shown in Figure 1.

Figure 1
The ADDIE Model Used as a Framework for the Development of the Yojo in the Kaili Land Board Game



3.1.1. Analysis Stage

The analysis phase seeks to figure out what problems are seen in learning Pancasila and Civics in the Merdeka Curriculum, which can be used by teachers of Civics to explore local wisdom. This review also examines what students and Civics teachers need in order to improve the quality of learning materials. The results of interviews and observations of class VIII SMPN 12 Palu explained that learning is still conventional and interactive. This learning media will introduce teachers to the values of Pancasila as applied in a contextual manner. Because it is so abstract, students struggle to connect the meaning of Pancasila with their everyday life and local cultural values. The theoretical nature of some of the textbook contents and lecture methods is an obstacle to internalizing some of the concepts taught (Prakoso et al., 2024; Sudarmin et al., 2024). A limited recognition of the Kaili Tribe's cultural identity further constrains the meaningful understanding of local wisdom among students.

According to these observations, a board game, Yojo in the Kaili Land, with AR techniques, was further created to help students understand and participate. The novelty of the game is how it not only introduces them to the symbol of Pancasila but also interconnects them with both Kaili culture and language studies in contextualisation and interactivity of learning game (Curkpatrick et al., 2024; Oktaviani et al., 2024; Solehuddin et al., 2024; Sudarmin et al., 2024). With the help of AR, students can find visual and audio information, which can help them make learning interactive, active, and

meaningful. When conducted in this manner, Yojo in the Kaili Land is assumed to be an effective medium of Pancasila literacy and an effort in increasing local cultural awareness.

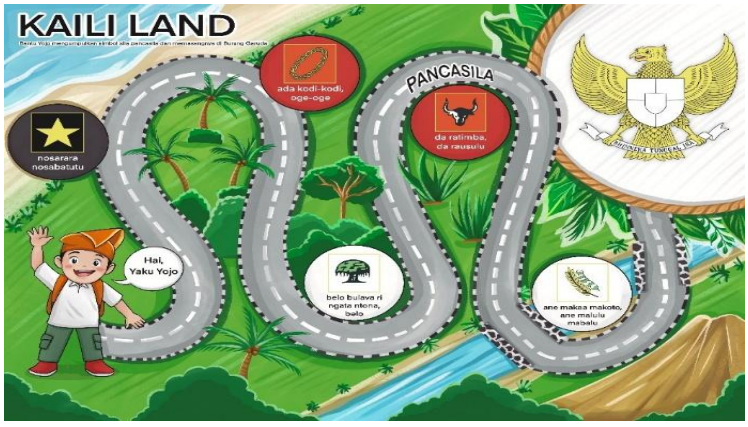
3.1.2. Design Stage

At this stage, the Yojo in the Kaili Land board game was designed as a civic learning media that was developed from the local wisdom of the Kaili Tribe. This stage included learning media development plans, AR technology implementation, visual design, and educational materials to maintain students' engagement (Kengo et al., 2024; Nautiyal et al., 2024; Parekh et al., 2021). We identified the game's key components and integrated them with the local culture, and created attractive, easy-to-understand visuals with Canva and Adobe Illustrator CC. The AR used was created through Assemblr Studio, and then students could scan the QR code on the Pancasila symbol in order to view interactive content in the text, animation, and audio. The game has realistic context-based questions that induce the students to think and apply them in real life. The initial PowerPoint of the board game is shown in Figure 2, and the display with the QR code that can be scanned to enable the AR feature is shown in Figure 5.

3.1.3. Development Stage

The development phase of the Yojo in the Kaili Land game involved developing the game board, educational cards, and visuals, as well as the integration of AR to facilitate the learning experience of the students. The AR feature was created in Assemblr Studio, and Android/IOS OS users can scan the QR code on the Pancasila symbol to view the animation, the explanation text, and the audio of the local wisdom of the Kaili Tribe (Bassey et al., 2020; Patil et al., 2023). Besides its technical facts, the visual design of the game was supposed to be educational, aesthetic, and intuitive, with the help of the graphics design program. Components were piloted to verify the efficacy of their intended use to promote learning through use (Curkpatrick et al., 2024). Figure 2 shows Assemblr Studio's interface, which integrates AR features into the board game.

Figure 2
Initial Design Layout of the Yojo in the Kaili Land Board Game, Illustrating the Integration of AR Components with Traditional Board Elements



Furthermore, researchers identified wise sayings in the local wisdom of the Kaili Tribe that are aligned with the values of Pancasila, so that it could be a contextual approach in local culture-based learning. The first precept, Belief in One God, is associated with the expression '*Nosarara Nosabatutu*', which reflects brotherhood and unity in religious diversity by upholding tolerance. The second precept, Fair and Civilised Humanity, is relevant to the expression '*Ada Kodi-Kodi Oge-Oge*', which emphasises the importance of justice and care for one another. The third precept, Indonesian Unity, is linked to '*Belo Bulava Ringata Ntona*', which describes the value of togetherness and unity in society. Meanwhile, the fourth precept, Democracy Led by Wisdom in Consultation/Representation, is aligned with '*Da Ratimba Da Rausulu*', which teaches the principles of deliberation and wisdom in decision-making. Finally, the fifth precept, Social Justice for All Indonesian People, is represented through '*Ane Makka*

Makoto Ane Malulu Mabalu', which emphasises balance in attitude and action as leaders and members of society. Thus, the local wisdom of the Kaili Tribe not only reflects the values of Pancasila but can also enrich learning approaches that are more contextual and applicable. Based on this advice, a card explaining the meaning of Kaili was created, as shown in Figure 3.

Figure 3
Explanation Cards of Pancasila Values: (a) Explanation Card Written in Bahasa Indonesia, and (b) Explanation Card Incorporating Kaili Local Wisdom

(a) (b)



3.1.4. Implementation Stage

In the implementation stage, the previously developed Yojo in the Kaili Land application was used in a real environment to assess its effectiveness as an educational medium for understanding the values of Pancasila in relation to the local wisdom of the Kaili Tribe. This stage involved five experts and teachers who contributed to the evaluation of the app's educational effectiveness. Unlike classroom-based testing, this stage emphasised independent user interaction with the app, allowing users to engage with the content at their own pace (Amarilli & Timakova, 2024; Chiang & Hsu, 2023; Pantazidou, 2025; Shpak, 2023; Sulbaran Reyes et al., 2024). The main objective was to evaluate the practicality, interactivity, and pedagogical value of the app, mainly focusing on the functionality of the integrated AR features.

As illustrated in Figure 4, the layout of the Yojo in the Kaili Land board game is embedded with AR capabilities, where each Pancasila symbol is paired with a QR code. These codes are linked to educational content that presents the meaning of each Pancasila precept through AR-enhanced text, animation, and audio explanations. This technology allows users to scan the symbols and receive information that is relevant to the Kaili culture and tradition, as further illustrated in Figure 5.

Figure 4
The Physical Layout of the Yojo in Kaili Land Board Game Integrated with AR Features



Figure 5
QR Code Representing the First Principle of Pancasila and the AR Scanning Process Conducted During the Experiment



The usage experience starts with an initial QR code scan that displays a welcome message and a tutorial on how to use the app. After understanding the interface, the user continues the game by playing the character Yojo, starting from the starting point and exploring each stop post. At each post that displays the Pancasila symbol, the user is asked to name and explain the meaning of the symbol. Answers are then verified by scanning the corresponding QR code, which provides more precise information. If the answer is correct, the app displays an additional explanation of the relevant Kaili local wisdom; if incorrect, the user is encouraged to relearn and try again.

Users are also asked to reflect on the learning materials provided by the AR, to do problem solving, and to find the values of Pancasila associated with the proverbs or wise words of the Kaili language. At the end of the session, they take a quiz assessment based on Bloom's Taxonomy, covering three cognitive levels: remembering, analyzing, and applying, each aimed at connecting Pancasila values to students' daily lives. This piloting phase is important to determine technical limitations and pedagogical weaknesses of the app before being pushed more broadly.

3.1.5. Evaluation Stage

At this point, the created Yojo in the Kaili Land board game was examined and evaluated by experts and experienced teachers from their field. This study was expected to evaluate the quality of the design, the effectiveness of its interactive features, and how relevant the content was to local wisdom-based Civics learning purposes. The board game was evaluated through the experts in media, and comments from the teachers and the students' self-response toward using the board game in learning. The evaluation was carried out using an interview with respondents to critique the game through various aspects, such as visual design, interactivity, AR features, and the availability of local wisdom while learning. This review obtained information on the good practices and areas of improvement of Yojo in the Kaili Land. Revisions to the game were made if a lack in the game's design or mechanics was identified, so that this board game can be adequately employed for learning.

3.2. Trustworthiness

The trustworthiness of the data in this research was tested through interviews with research subjects (see Section 3.1.1), three education and learning technology experts at Tadulako University, and two teachers teaching Pancasila at a junior secondary school (see Table 1). The professionals had experience in technology integration in education and designing and evaluating digital-based educational media. An interview guide was drafted to collect systematic data on the following five dimensions: interviewees' demographic characteristics, content, function, and design of the Yojo in the Kaili Land board game, and comments and suggestions for future revision. In total, nineteen questions were addressed to the experts to assess whether the board game was effective or not in helping the students learn Pancasila values, referring to their own tradition. Thematic analysis was used to analyse the data; the interview transcripts served as the foundation for coding and categorisation of the findings. It was

assumed to be suitable for finding patterns and meaningful interpretation of effectiveness and potential development of board games in interactive learning media.

3.3. Background of the Experts

Experts' background, identity, academic credentials, and professional experience in the field of education and learning technology are included in this section. The experts of the current study were highly experienced, and thus the observations reported were deeply rooted in theory and practice in education. As presented in Table 1, the experts were from different educational and professional backgrounds with competencies in Pancasila education, learning technology, and local wisdom integration in education. They had an average of 10 to 22 years of experience, indicating their expertise. The diverse backgrounds and experiences among the experts who evaluated Yojo in the Kaili Land made the evaluation holistic and in keeping with contemporary education practices and learning technologies.

Table 1
Background of the Participants

Participants	Gender	Explanation	Expert Experience
P1	M	Lecturer affiliated with the Informatics and Computer Engineering Education Study Programme at the Faculty of Engineering, Universitas Negeri Makassar, has experience in technology development and technology-based learning media.	19 years
P2	F	Lecturer affiliated with the Department of Educational Technology, Faculty of Education, Universitas Negeri Makassar, has expertise in character education and technology integration in learning.	22 years
P3	M	Instructor of Driver Teacher Education with 14 years of experience in digital and multimedia-based learning.	14 years
P4	M	Computer and Network Engineering (TKJ) subject teacher SMK Negeri 1 Palu has experience developing innovative learning media.	12 years
P5	F	Pancasila and Civic Education (PPKn) subject teacher SMK Negeri 1 Palu has experience in learning in the field of PPKn.	10 years

4. Results

4.1. Content of the Yojo in the Kaili Land Board Game

This subsection assesses the Yojo in the Kaili Land board game via six oriented questions with regard to the experts listed in Table 2. These items were developed to identify the pedagogical worth of the game, its alignment with the content of the Merdeka Curriculum, and the degree to which interactivity led to increased engagement with the game. This AR board game combines AR tech and multimedia elements such as images, animations, and audio for increased interaction and enjoyment of learning. According to expert views, these interactive features significantly increase the appeal of the game and make it easier for students to understand in practice based on Pancasila values. In addition, the dynamic nature of the content encourages active learning, an essential component in modern educational technology.

Table 2
Evaluation of Yojo in the Kaili Land Board Game by Experts

No	Question	Expert Opinion
1	Based on your observations, what do you think about the content of the AR-based Yojo in the Kaili Land board game for Civics learning?	The Yojo in the Kaili Land board game is an interesting innovation in Civics learning. With AR, students are more active and engaged through visuals, audio, and interactive animations. The content is customised to the Merdeka curriculum and the local wisdom of the Kaili Tribe, helping students connect the values of Pancasila to

		everyday life. Real situation-based scenarios encourage critical thinking, while AR features make learning more interactive and immersive (P1 and P2).
2	Is the content in this board game suitable for local wisdom-based Civics learning?	The content of this board game is very much in line with local wisdom-based Civics learning. This board game not only teaches the values of Pancasila but also connects them to the culture and traditions of the Kaili Tribe, making learning more relevant and meaningful for students (P1 and P2).
3	Based on the observations, does this board game follow the Merdeka curriculum standards and assessments set by the government?	This board game has been adjusted to Merdeka curriculum standards, but needs improvement. The content is in line with the Merdeka Curriculum, which emphasises real context-based learning and exploration of local wisdom, thus supporting the achievement of the expected competencies in the curriculum (P1 and P2).
4	Are the exercises and activities in this board game appropriate for the levels of Bloom's Taxonomy?	The exercises and challenges in the game have been designed according to the levels of Bloom's Taxonomy, covering a basic understanding of how Pancasila values are applied in real life (P1 and P2).
5	In your opinion, can students internalise Pancasila's values easily through this board game?	This board game effectively helps students understand and internalise Pancasila's values, as it connects concepts with play experiences relevant to real life (P1 and P2).
6	In your opinion, what recommendations can be given to improve the effectiveness of this board game?	The panel provided several recommendations: 1) Include more explicit learning objectives at the beginning of the game, 2) Use more consistent graphic elements on each game card, and 3) Ensure the AR feature is optimised with clear navigation buttons (P1 and P2).

4.2. Functionality of the Yojo in the Kaili Land Board Game

The functionality of the Yojo in the Kaili Land board game, developed as AR-based learning media, includes text, images, animations, videos, and colours that increase student engagement in understanding the values of Pancasila. Table 3 summarises the researchers' questions and the experts' responses regarding the functionality aspect of this board game.

Table 3
Functionality of Yojo in the Kaili Land Board Game

No	Question	Expert Opinion
1	Is this board game suitable for junior high school students?	This board game is suitable for junior high school students. The design is interesting and interactive and uses AR, which makes learning Civics more fun and easy to understand because it connects the values of Pancasila with everyday life, so the material becomes more relevant and meaningful to them (P3, P4, and P5).
2	Can this AR-based board game help students improve their understanding of Pancasila values?	Of course, this board game can help students understand Pancasila values better. Its interactive features allow students to read the theory and experience first-hand the concept of Pancasila through visuals, animations, and real-life scenarios, making learning more interesting, contextual, and meaningful (P3, P4, and P5).
3	Can this board game facilitate students in the learning process of local wisdom-based Civics?	This board game is very helpful in learning local wisdom-based Civics. It presents real-life scenarios that make students more active in thinking critically and connecting the concepts of Pancasila with their daily experiences (P3, P4, and P5).

4	Based on your observations, what are your views on the board game design regarding i) graphics/ video/ animation, ii) writing, and iii) colours?	The design of this board game is quite interesting and appropriate for junior high school students. The graphics, videos, and AR animations make learning more interactive and immersive. In addition, the clear writing and bright colour combinations help students understand the material comfortably without losing focus (P3, P4, and P5).
5	Based on your observation, will this board game influence students using digital technology?	The board game can improve students' digital literacy by introducing AR technology to learning. AR in this game encourages students to be more familiar with interactive technology, which aligns with the development of the digital era. However, adequate device access and a stable internet connection are required for an optimal learning experience (P3, P4, and P5).
6	In your opinion, what recommendations can be given to improve the functionality of this board game?	The board game is already exciting, but it can be enhanced in many ways. First, it must have an offline access feature, so that AR does not depend on the internet to be used. Second, support for multiple types of digital devices, such as tablets and laptops, should be provided to achieve more flexibility in classroom use. Third, the graphics and animation details would be improved to make them more sensitive and interactive for students (P3, P4, and P5).

Interviews with experts indicated that Yojo in the Kaili Land holds strong potential to support Civics learning grounded in local wisdom. Expert feedback highlighted the game's strengths in both design and functionality, particularly its effective use of integrated AR technology to enhance student engagement and understanding. In addition to these positive evaluations, the experts also offered several suggestions for improvement, focusing on increasing accessibility and optimizing device compatibility. While the game is considered largely effective, recommendations include enabling offline access, supporting multiple digital platforms, and refining visual elements to ensure broader inclusivity and ease of use across diverse educational settings.

5. Discussion

The purpose of this research was to construct and develop AR-based learning media in the form of an educational board game entitled Yojo in the Kaili Land. This media was designed to enhance the students' comprehension of Pancasila values by using the local wisdom of the Kaili Tribe. This research aimed to develop a contextualized, reflective, and fun learning environment that is more connected with the younger generation through the union of digital technology and local culture. This method encourages the development of digital and national literacy, but also reflects the difficulties that character education faces in an age of technological dislocation.

The model that was used in the construction of this board game is based on the ADDIE model: analysis, design, development, implementation, and evaluation. Analyzing students' approaches, it was observed that several students had problems understanding and connecting with the values of Pancasila in their lives with respect to local culture. This finding confirms earlier investigations, which suggested that traditional text-based approaches are less motivating and effective triggers for critical thinking in students (Amarilli & Timakova, 2024; Azizoon et al., 2025; Xiong et al., 2021). After the process of design and development, the stages resulted in the game-based interactive learning media with QR scans into each Pancasila symbol, where users can access varied content in text, animation, and voice (Huffer & Oxenham, 2015; Pantazidou, 2025; Türkoğlu, 2019). Assessments of this media suggest that learners feel they are learning in a more participatory manner that allows students to better internalise the values being taught in a more nuanced and fun way.

Based on observations and interviews with teachers and educational experts, the research suggests that Yojo in the Kaili Land integrates the content in situ. This is in accordance with the value-based learning

in the Merdeka Curriculum (Saefudin et al., 2024; Samaden, Ahmad, & Salam, 2025). The AR lets students not only learn visually but also reflectively by linking local to live and real-life experience based on the principle of Pancasila (Nuraedah & Saefudin, 2024; Utomo et al., 2024). Under this model, rather than simply consuming values, students are presented with information and encouraged to explore and connect it to their own lived experiences. Expert reviews yield that the media meets the criteria for learning media based on local wisdom and is feasible to be developed for a digital-mediated platform. It is to support more flexible use in diverse contexts of schools (Kengo et al., 2024; Nautiyal et al., 2024).

This research suggests that the urgency of creating technology-based learning media that are culturally rooted is required as a strategy in citizenship education in an adaptive and transformative manner. Yojo in the Kaili Land is a working example that technology, especially AR, is much more than just visualisation; it is the mediator between values and everyday life experiences of students in their social and cultural contexts. This method presents an interesting opportunity to inculcate Pancasila values in a more contextual approach, which will, at the same time, strengthen students' characters, national identity, and digital literacy throughout meaningful learning. Such advances help to illuminate a vision of an education system that is more attuned to the complexities of the times and to the requirements of 21st-century learners.

To enhance the scope and efficacy of Yojo in the Kaili Land, further study is advised to apply Yojo in a variety of regions with different cultures. This cross-cultural study is necessary in order to examine how far the game design can accommodate local preferences, but also how relevant Pancasila values are in Indonesia's pluralistic and diverse situation. Additionally, developing offline features and enhancing cross-device compatibility are crucial aspects to ensure this medium is accessible equitably, including in areas with limited technological infrastructure. Future studies are expected to not only focus on instructional effectiveness but also explore the long-term impact of integrating technology and local culture on character development, strengthening digital literacy, and the active role of families and communities in building an inclusive and collaborative value-based educational ecosystem.

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