Pancasila Adventure: An Android-Based Educational Game Innovation to Sharpen Vocational Students' Critical Thinking Skills

Ajeng Setyo Rini [1], A. Rosyid Al Atok [2]

[1] [2] *Pancasila and Citizenship Education Study Program, Faculty of Social Sciences,* Universitas Negeri Malang, Indonesia
Corresponding Author: Ajeng, Email: ajeng.setyo.2207116@students.um.ac.id

Abstract. The urgency of this research arises from the limited availability of engaging and interactive learning media in Pancasila education, particularly at the vocational high school level. The dominance of one-way learning methods results in low student participation and limited opportunities to develop higher-order thinking skills (HOTS). This research aims to develop an educational game, Pancasila Adventure, that is valid, practical, engaging, and effective, oriented towards improving students' critical thinking skills. This research adopts the Lee and Owens (2004) development model, which consists of five stages: analysis, design, development, implementation, and evaluation. The validation results from material experts obtained a score of 96.7, and from media experts 88.5—both categorized as very valid. The practicality test achieved a score of 4.7 (practical), while the small and large group trials scored 83 and 84 (engaging), respectively. The effectiveness test showed an average score of 83 (effective). This research integrates the improvement of critical thinking with HOTS-based interactive games, providing both theoretical and practical contributions to the development of game-based learning in Pancasila education.

Keywords: Learning Media; Pancasila Education; Educational Game; Pancasila Adventure; Critical Thinking Skills

INTRODUCTION

In today's digital age, the learning process is no longer limited to textbooks but has evolved into more innovative forms that encourage the development of students' critical thinking skills. While textbooks are a primary reference, relying solely on printed materials can lead to one-way learning, leading to students' inactivity and stunted critical thinking development. Today's fast-paced and changing world demands critical, analytical, and collaborative thinking skills (Edwin et al., 2025; Heffington & Coady, 2023; Redhana, 2019). This situation has caused a paradigm shift in education, where initially education focused more on delivering ready-to-use information, now education is directed at encouraging students to actively learn to seek information independently actively and critically in accordance with current demands (Pratama et al., 2019). Mastering critical thinking skills also contributes to the development of soft skills needed in the modern workplace (Pavlenko et al., 2025; Rismana & Hernawati, 2025; Suleimanova et al., 2023; Tripathy, 2020).

Critical thinking skills are closely related to the concept of Higher Order Thinking Skills (HOTS). HOTS is defined as high-level thinking skills that involve creativity, critical analysis, and critical use of data and information in solving a case (Iftirosy et al., 2025; Misrom et al., 2020; Safrida et al., 2021; Suyatno et al., 2023; Zulfah et al., 2022). The implementation of HOTS

learning requires more innovative and challenging strategies than traditional lecture methods (Ali et al., 2024; Nordi & Husaini, 2024). The implementation of HOTS-based learning requires consideration of student characteristics. Based on observations, the majority of students at SMK Negeri 2 Probolinggo are male and tend to be active and dynamic. They show a high interest in challenging activities, including playing games on their smartphones. Most students prefer playing games to listening to teacher explanations. This situation sometimes requires teachers to confiscate students' smartphones to maintain their attention.

Given the active and game-loving nature of students, the HOTS approach can be utilized through the development of educational game-based learning media. Through games, higher-order thinking challenges can be packaged into four challenging activities that must be completed. Educational games aim to train concentration so users are more focused on developing concepts and understanding, guide them in developing skills, and motivate them (Amanda & Rianto, 2018). Through this approach, it can increase motivation, activity, attention to learning, and make it easier for students to understand the material (Putri & Lestari, 2023). Educational games can also make learning activities less monotonous (Damarjati & Miatun, 2021).

Research conducted by Nurhikmah et al., 2024; Rambe et al., 2024; Sukmawati et al., 2025 shows that delivering learning materials through game-based digital education can improve thinking skills while providing students with learning freedom Sukmawati et al., (2025) proves that the implementation of educational games has a significant influence on improving students' critical thinking skills. Damarjati & Miatun, (2021) shows that the development of digital educational game learning media as a learning medium oriented towards critical thinking skills is said to be effective in training students' critical thinking skills. Furthermore, Fanani & Kusmaharti, (2018) stated that digital-based learning media that is oriented towards critical thinking skills can facilitate students' learning process and develop their critical thinking skills.

Critical thinking can be achieved through the Pancasila Education subject, which not only focuses on understanding the nation's core values, but also aims to encourage students to connect these values with the realities of everyday life (Nurgiansah et al. 2024). However, in practice, Pancasila Education still faces various challenges, particularly low student engagement. This is due to a teacher-centered learning approach dominated by lecture methods. This finding aligns with research by Kusumawati, Wahono, and Bowo (2021) which states that teachers still play a dominant role in Pancasila Education and tend to assign assignments without facilitating active learning. This results in students becoming passive and their critical thinking skills not developing optimally.

Based on the questionnaire results, it was found that 82.28% of students stated that teachers still use the lecture method in delivering material, and 72.57% of students stated that teachers only rely on textbooks as the main learning source. Meanwhile, 86.28% of students stated that they were more motivated when using technology-based learning media, and 85.71% of students wanted learning media that allowed them to learn independently through various interactive activities. Furthermore, based on the results of teaching assistance, it appears that most students are more accustomed to memorizing material rather than analyzing or connecting it to real-life contexts. This condition is evidenced when students are able to repeat the content of the material verbally, but are not yet able to explain its meaning or provide examples of its application in depth. This learning pattern that is still oriented towards memorization has an impact on students' low critical thinking skills.

These findings reinforce the urgency of developing learning innovations that are not only visually appealing but also effective in stimulating critical thinking skills. Previous research has shown that educational games are effective as learning media that can support the development of critical thinking skills. This research will develop Android-based learning media because Android devices are the most widely used and easily accessible (Atoillah, Gonzales, and Amirulloh 2024; Farkade and Kaware 2015; Han 2024; Nabilah 2023). This learning media, named Pancasila Adventure, was developed using Construct 2. The advantage of using Construct 2 is its ease of use, allowing developers from various skill backgrounds to use it. Furthermore, this tool also has a simple interface equipped with a drag-and-drop feature that can help developers design learning media efficiently without having to write code manually (Khoirunnnisya' 2021; Saputra and Oswari 2020; Tursinah, Hariyanto, and Hatmono 2020).

Several previous studies have shown that the use of game-based learning media can increase learning motivation, student engagement, and facilitate understanding of learning concepts. Several studies have also developed digital media oriented towards Higher Order Thinking Skills (HOTS) to train students' analytical and problem-solving abilities. However, most of these studies still focus on general education contexts such as elementary, middle, and high schools. This research is novel because the development of educational game-based learning media to train critical thinking skills in Pancasila Education learning within the context of vocational education is still relatively limited. In fact, the characteristics of vocational high school students are more directed towards applied learning and skills relevant to the world of work.

Based on the description above, the novelty of this research lies in the development of media that is not only designed to increase student engagement, but also equipped with the preparation of questions developed based on the principles of Higher Order Thinking Skills

(HOTS). This research aims to develop educational game learning media oriented to critical thinking skills for grade X students of SMK Negeri 2 Probolinggo. The questions in this media are designed to encourage students to engage in higher-order thinking processes. In addition, the learning materials developed have been adjusted to indicators of critical thinking skills. This research contributes to teachers in providing alternative learning media that are appropriate to the characteristics of vocational high school students. Academically, this research enriches the study on the development of game-based learning media in vocational education, especially those that integrate the HOTS approach and critical thinking indicators in learning design.

LITERATURE REVIEW

Media is a tool in the learning process that is not only used in the classroom, but can also be used outside the classroom to facilitate the delivery of teaching materials to students containing learning materials. Learning media can be in print or audiovisual form, including hardware technology. Learning media develops in accordance with the development of learning technology (Rohani, 2020). Choiri, (2022) states that learning media is useful for conveying messages so that it is expected to increase interest and stimulate the thoughts, feelings, and attention of students. Therefore, the use of good learning media can achieve learning objectives optimally. In line with this, Syihabuddin, (2022) also argues that the use of learning media can increase interest and motivation to learn, even influencing students' psychological aspects.

Educational games make the learning process more varied and less boring, thus making learning more meaningful (Hasnimar, 2024). Damarjati & Miatun, (2021) explain that educational games can increase student participation in learning, thereby stimulating students' enthusiasm for learning. Another opinion states that educational games are useful in terms of supporting learning tools, because these games are not only designed to complete missions like games in general, but also equipped with learning information within them (Samin, 2023). Unlike regular games that emphasize more entertainment, the characteristics of educational games lie in interactivity, the presence of rules to be solved, and the presentation of information in visual, audio, and simulation forms (Malone & Lepper, 1987). Thus, educational games not only make learning more interesting but also provide space for students to practice decision-making, problem-solving, and interact with learning content.

Pancasila education is the ideological education of the Indonesian nation that aims to shape good citizens, by understanding the rights and obligations of citizenship, love of the homeland, and possessing a spirit of nationalism (Akhyar & Dewi, 2022). Pancasila education is fundamental for every Indonesian citizen, because to live life must be adapted to the values of Pancasila (Kurniawaty, 2022). Initially, Pancasila education was known as Civics. Later it

changed to State Citizenship Education, Citizenship Education, and PMP. Over time, the term PMP was removed and replaced with Pancasila and Citizenship (PPKn), Citizenship and History, PKn, PPKn. Until now, it is known as Pancasila Education (Narmoatmojo, 2022).

Field findings indicate that a common problem in Pancasila education is the lecture-dominated approach, resulting in students being less active and less interested in participating. This finding aligns with research by Kusumawati, Wahono, and Bowo (2021:27), which states that in Pancasila education, teachers are heavily involved and often give students assignments to learn independently. As a result, students tend to be passive in their learning, and their critical thinking skills are not developed.

Susanti et al., (2022) define critical thinking as an intellectual process aimed at finding information through continuous consideration to produce valid arguments and conclusions. Critical thinking is not merely memorizing and retelling, but also enables students to formulate problems clearly and in detail (Wardani et al., 2024). Critical thinking can increase intelligence, help carry out tasks, and find alternative solutions in terms of problem-solving. Someone who has critical thinking skills will be able to distinguish between facts and opinions and thus can draw conclusions (Susanti et al., 2022). Fitriani et al., (2021) also state that critical thinking skills are used as problem-solving in overcoming current problems. Someone who has critical thinking skills will make themselves more independent and more confident. The rapid flow of information from various sources makes someone confused about distinguishing between true and false information.

The connection between critical thinking and games lies in the problem-solving mechanism that is at the core of games. Each level or challenge in a game typically requires students to understand the rules, analyze the problem, consider alternative solutions, and draw conclusions to continue the game. This process aligns with indicators of critical thinking, such as when students must interpret instructions (interpretation), choose the right strategy (analysis and evaluation), or explain the reasoning for their chosen answer (explanation). In other words, educational games provide a learning environment that encourages students to develop critical thinking skills naturally through fun and challenging activities.

The results of research conducted by Rambe et al., (2024) prove that game-based learning media can provide a more enjoyable learning experience, provide better interaction, make learning interesting, and facilitate 21st-century skills. Research by Nurhikmah et al., (2024) also proves that the use of educational games can make students more enthusiastic and less bored in learning. In addition, Sukmawati et al., (2025) also proves that the application of educational games has a significant influence on improving students' critical thinking skills. Research by Damarjati &

Miatun, (2021), also shows that the development of digital educational game learning media as a learning medium oriented towards critical thinking skills is said to be effective in training students' critical thinking skills. Furthermore, Kusman, (2022) also states that digital-based learning media oriented towards critical thinking skills can facilitate students' learning process and develop their critical thinking skills.

Based on the description above, educational games have the potential to increase motivation, engagement, and interest in learning. However, research specifically developing educational games for Pancasila Education, focusing on improving students' critical thinking skills, is still limited, generally applied only to mathematics lessons. Furthermore, there is limited research integrating game elements with the dynamics of the birth of Pancasila in a systematic and appropriate learning medium.

RESEARCH METHODS

Types and Approaches of Research

This study uses a Research and Development (R&D) design based on Lee and Owens (2004). This model adapts the ADDIE framework. This model was chosen to produce digital learning media in the form of an educational game entitled "Pancasila Adventure", which is oriented towards improving students' critical thinking skills. The stages of the ADDIE model include assessment/analysis consisting of needs analysis and initial analysis (front-end analysis), design, development, implementation, and evaluation. This development model was chosen because it provides a systematic structure in the development of learning media, thus aligning with the research objectives that allow researchers to design, develop, and evaluate the developed product until it produces a viable product. Other research models such as SAMR focus more on the level of technology integration in learning, rather than on the media development process itself, the Dick and Carey model is more suitable for curriculum development or large learning systems, the Merrill's Principles of Instruction (MPI) model is more suitable as a pedagogical foundation to ensure the content and activities in the media are effective (Drljača et al., 2024). The stages of the ADDIE development model are shown in Figure 1.

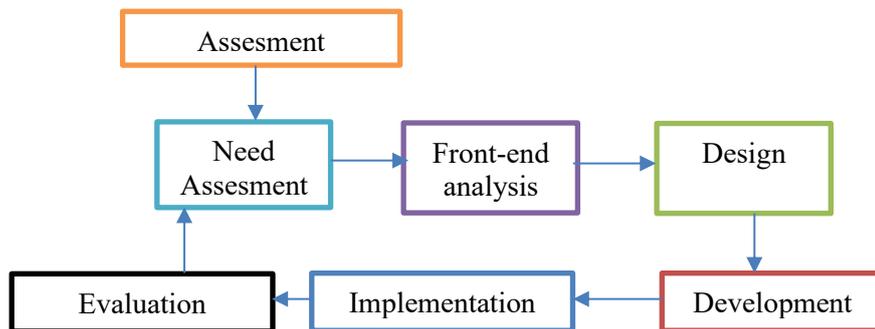Figure 1 Lee & Owens 2004 Development Model

Development Procedures

This research uses the ADDIE development model, which consists of several stages: assessment/analysis, which includes needs analysis and initial analysis, design, development, implementation, and evaluation. The media development procedure can be seen in Figure 2.
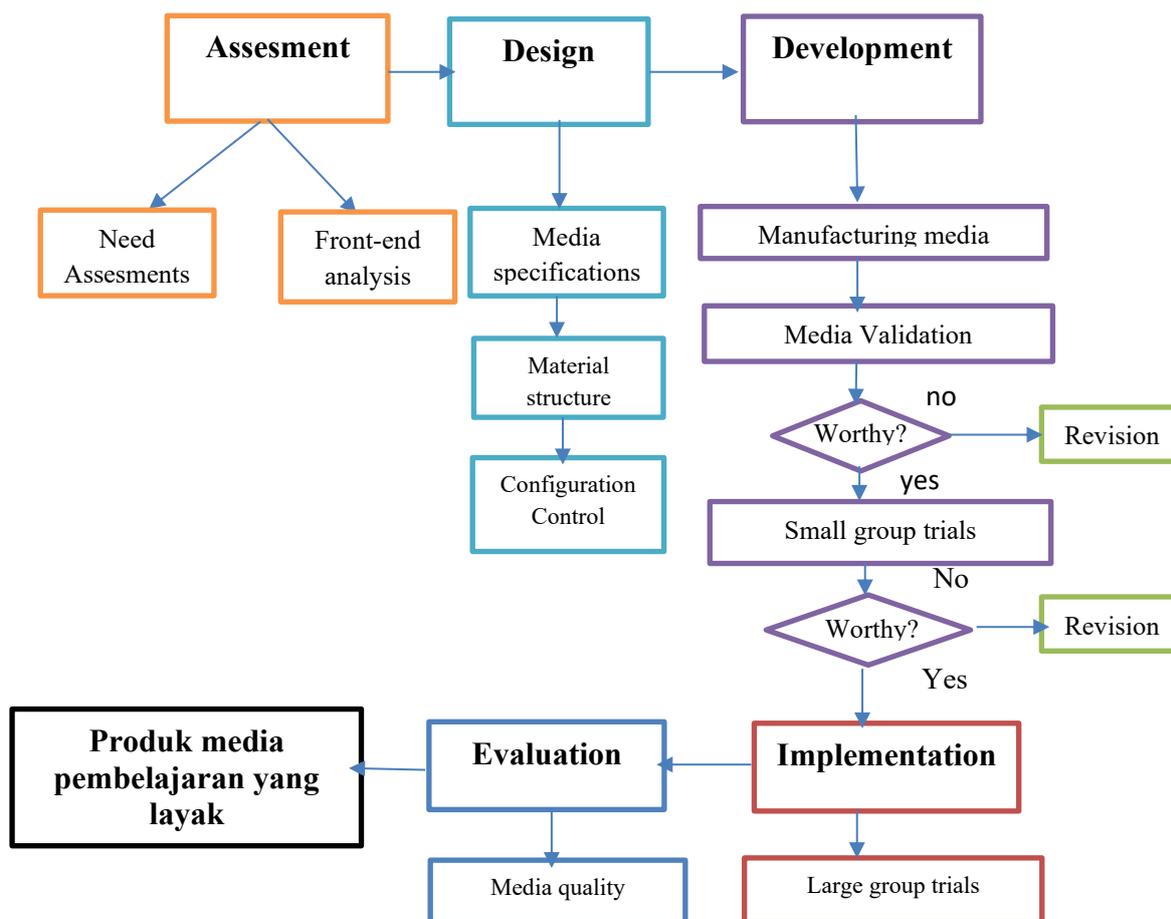

Figure 1 Media Development Procedurs
Source: Researcher (2025)

Trial Design

The test subjects in this study consisted of: (1) material experts with the criteria that lecturers are experts in Pancasila learning and civic education and have a minimum of 5 years of teaching experience; (2) material/teaching media experts with the criteria that lecturers are experts in learning technology with a minimum of 5 years of teaching experience; (3) learning practitioners, namely class X teachers of SMK Negeri 2 Probolinggo with the criteria of a minimum of 5 years of teaching experience; (4) 6 class X students of SMK Negeri 2 Probolinggo were randomly selected to test the initial draft of the product (limited group); all class X students of SMK Negeri 2 Probolinggo were tested for the main product.

Data Types

The data obtained in this research and development consisted of quantitative and qualitative data. Qualitative data consisted of comments, suggestions, and responses from expert validators and users regarding the developed media. Meanwhile, quantitative data was obtained from questionnaire assessment scores and learning outcome tests, including game quizzes within the developed media.

Data collection

The data collection instruments in this study were divided into two: preliminary information collection and research and development data collection. The preliminary data collection instruments consisted of observation guidelines and student questionnaires. The research and development data collection instruments are detailed as follows:

Table 1 Instrument Details

Assessment Aspects	Instrument	Respondents
Material validity	Validation Questionnaire	Material expert
Media validity	Validation Questionnaire	Media expert
Practicality of the product	a list of questions	Learning practitioner/teacher
Product appeal	a list of questions	Students of class 10 TPM 3 SMK Negeri 2 Probolinggo
Product effectiveness	Quiz (Evaluation)	Students of class 10 TPM 3 SMK Negeri 2 Probolinggo

Source: Researcher (2025)

Data Analysis Techniques

Details regarding the analysis of validity, practicality, attractiveness, and effectiveness are discussed as follows.

Data Validity

Data validity is obtained from two experts, meaning there will be two data validations: a material expert and a media expert. To calculate data validity, add up the expert assessment scores, divide by the maximum score, and then multiply by 100. After calculating the validity score, the score is then converted into quantitative data, as explained below.

$$P = \frac{x}{x_i} \times 100$$

Information:

P   = Value if the validity aspect
X = Achievement score
x_i = Ideal score
100   = Constant

Table 2 Subject Matter Expert Validity Criteria.

Criteria	Score	Information
Very Valid	85 – 100	No revisions
Legitimate	70 – 84	A little revision
Quite valid	55 – 69	Adequate revision
Invalid	40 – 54	Major Revision
Totally Invalid	25 – 39	Useless

Source: Researcher (2025)

Table 3 Media Expert Validity Criteria.

Criteria	Score	Information
Very Valid	75.7 – 90	No revisions
Legitimate	61.3 – 75.6	A little revision
Quite valid	46.9 – 61.2	Adequate revision
Invalid	32.5 – 46.8	Major Revision
Totally Invalid	18 – 32.4	Useless

Source: Research (2025)

Practicality

The practicality of the data presented is based on the assessments of Pancasila education teachers. This data will be analyzed descriptively and quantitatively using the formulas and criteria below.

$$\bar{x} = \frac{\sum X}{n} \text{x } 100$$

Information:

$\bar{x}$ = Value if practical aspects are considered
$\sum x$ = Achievement score
N = Statement item
100   = Constant

Table 4 Practicality Criteria.

Criteria	Score	Information
Very Practical	42 – 50	No revisions
Practical	34 – 41	A little revision
Quite Practical	26 – 33	Adequate revision
Not practical	18 – 25	Major Revision
Very Impractical	10 – 17	Useless

Source: Researcher (2025)

Attractiveness

Data appeal is divided into two categories: limited group appeal testing and field testing. Limited group testing is conducted to identify potential errors or deficiencies in the learning media, with the results used as a basis for improvements before implementation in the field test (Sari and Sugiyarto 2015). The data obtained from the attractiveness questionnaire will be analyzed using the following formula.

$$P = \frac{\Sigma x}{\Sigma xi} \; x \; 100$$

Information:

P   = Value of the attractiveness aspect
Σx = Achievement score
Σxi = Ideal score
100   = Constant

Table 5 Attractiveness Criteria.

Criteria	Score	Information
Very interesting	85 – 100	No revisions
Interesting	69 – 84	A little revision
Quite interesting	53 – 68	Adequate revision
Not attractive	37 – 52	Major Revision
Very Uninteresting	20 – 36	Useless

Source: Researcher (2025)

Effectiveness

Effectiveness data was measured using a test instrument in the form of a quiz contained in the Pancasila Adventure educational game given to students after using the media. Effectiveness data was obtained from the average results of students in one class. The test instrument consisted of 10 questions, consisting of 5 true-false questions and 5 multiple-choice questions. For true-false questions, students will receive a score of 5 if they answer incorrectly, and a score of 10 if they answer correctly. Multiple-choice questions have different value weights, namely 2, 4, 6, 8, and 10. The formula and criteria for the media effectiveness score are as follows.

$$Class \; Average \; Value = \frac{Sum \; of \; Achievement \; in \; one \; class}{Sum \; of \; students}$$

Table 6 Effectiveness Criteria

Score	Criteria
90 - 100	Very Effective
80 - 89	Effective
70 - 79	Quite Effective
60 - 69	Less Effective
50 - 59	Very Less Effective

Source: Researcher (2025)

RESULT

Assessment

The needs analysis revealed several key issues in Pancasila Education. These issues include limited learning media, which are still limited to textbooks and dominated by one-way lecture methods. This situation results in low student engagement during the learning process. In fact, students are often engrossed in playing games on their devices while the teacher is explaining. Their interest in games is considered higher because they offer a fun, challenging, and interactive experience. This fact is reinforced by the number of students who are frequently reprimanded by teachers for being engrossed in games and neglecting their study obligations.

The developed learning media focuses on the history of the birth of Pancasila for grade 10. Based on learning outcomes, students are asked to analyze the perspectives of the formulators of Pancasila regarding the foundation of the state. The verb "analyze" indicates that learning in this material is not limited to just memorization, but also requires students to think critically. This aligns with the HOTS (Higher Order Thinking Skills) domain because it requires students' abilities to process information, identify relationships between concepts, and draw conclusions based on a deep understanding of the material.

Based on the results of the analysis of field conditions and the distribution of questionnaires to 34 students, as many as 78.28% of students understand the material better if the teacher involves experiments or direct practice, and as many as 88% of them are more motivated to learn when using technology-based learning media. This situation is supported by the ability to use digital applications owned by 84.58% of students. The results of the questionnaire distribution also prove that students will be more enthusiastic about learning when given challenges in the form of games. As many as 85.14% of students will enjoy learning independently more.

Therefore, the use of interactive media is necessary to prevent learning from becoming teacher-centered. Furthermore, considering the characteristics of students who are closely associated with the world of gaming and technology, the need for technology-based media will create an active learning experience. Furthermore, developments in the 21st century require

students to have critical thinking skills to filter information wisely and resist being easily influenced by the rapid flow of information.

Design

This research produces Pancasila Education learning media in the form of an educational game in the form of an application (apk), which can be used in grade X. The product is named Pancasila Adventure to provide an identity to attract users. The word "Pancasila" indicates the focus of the learning material, namely the history of the birth of Pancasila as the foundation of the state. Meanwhile, the word "Adventure" means adventure which represents a learning approach that is exploratory, interactive, and challenging, thus providing a fun learning experience.
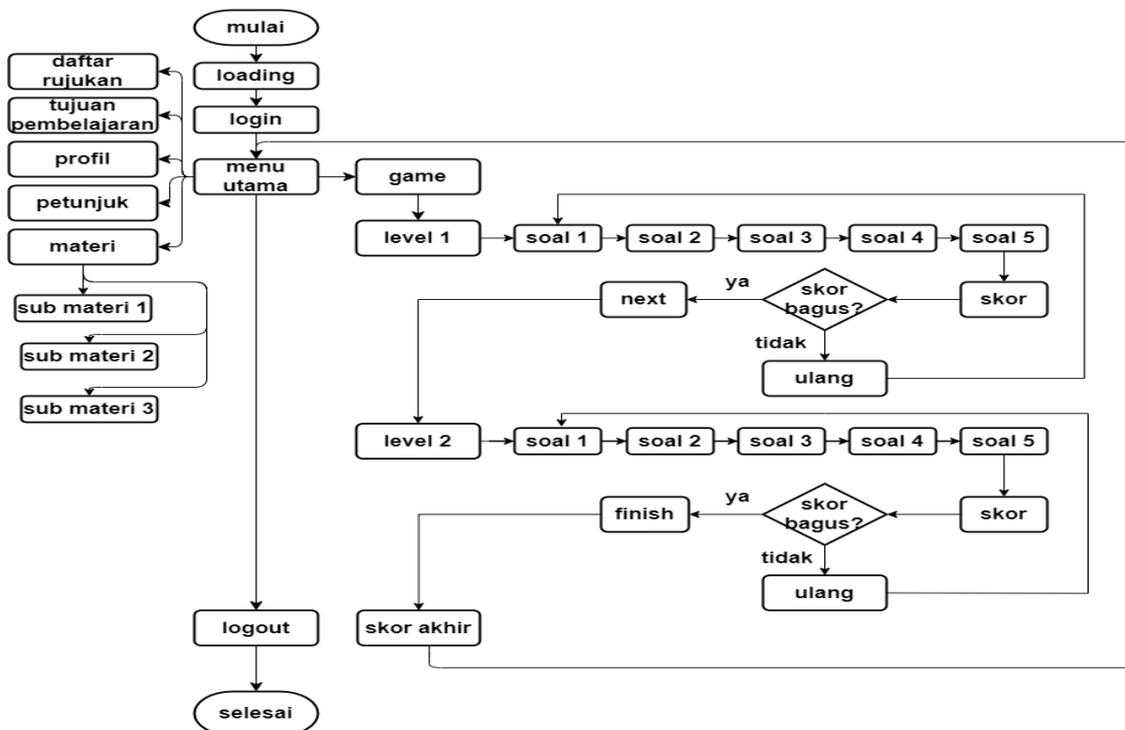
Figure 3 Pancasila Adventure Educational Game Flowchart
Source: Researcher (2025)

The media was developed through the game developer Construct 2, accessible via Android. Features include a login page, a main menu with a sidebar containing instructions, asset sources, and a developer profile. The menu page includes features for learning objectives, materials, and quizzes with automatic scoring. Quizzes can be completed directly without an internet connection. The material section contains several slides that require an internet connection because they are connected to external sources, such as Google Docs and YouTube.

The material is divided into three sub-chapters: the birth of Pancasila, the formulation of Pancasila, and the establishment of Pancasila as the foundation of the state.

The presentation of the material aligns with the established learning outcomes. The practice questions are divided into two sections: the first level consists of true-false questions and the second level consists of multiple-choice questions. For true-false questions, an incorrect answer will earn 5 points, and a correct answer will earn 10 points. The flowchart of the Pancasila Petualangan learning media is shown in the image below. The media display can be seen in the image below.

Figure 4 Initial Media View

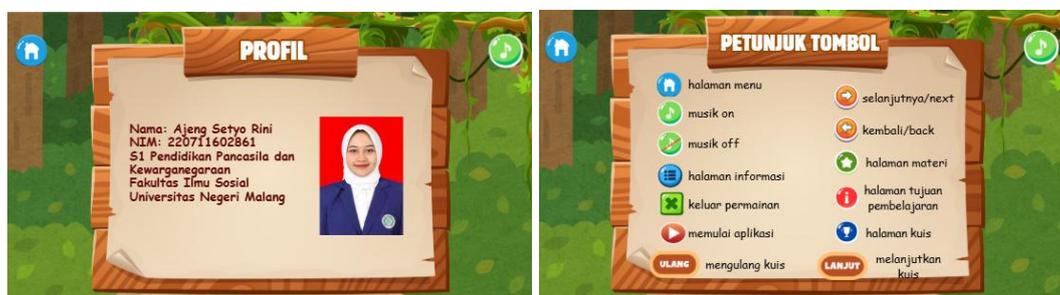Figure 5 Main Menu and Sidebar View

Figure 6 Profile Page and Instructions

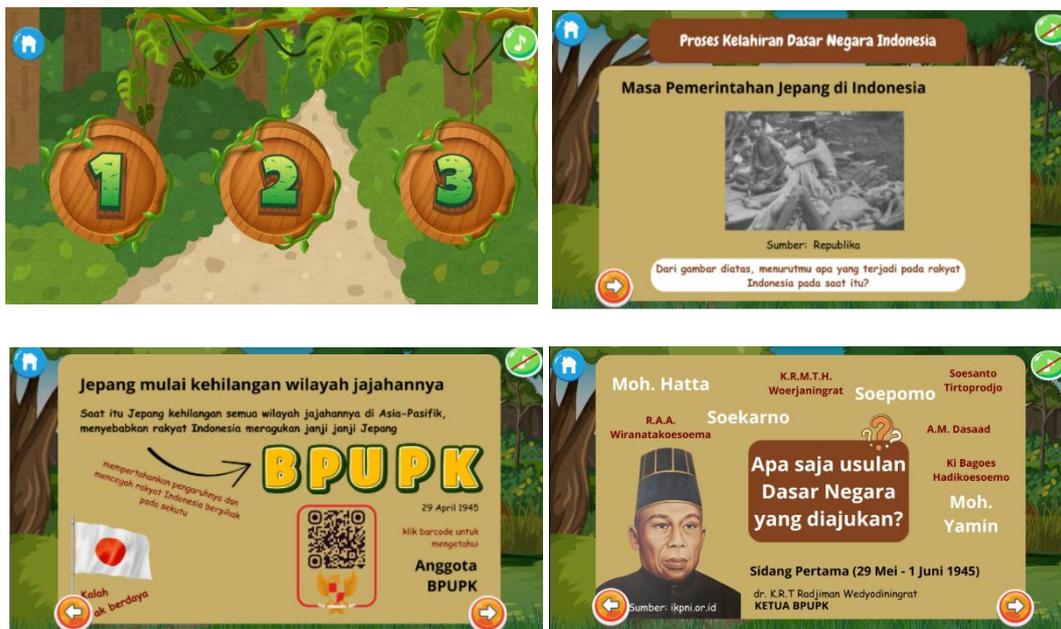Figure 7 Learning Objectives and References Page

Figure 8 Content Display

Figure 9 True False Quiz Page

Figure 10 Multiple Choice Quiz Page

Figure 11 Finished Page

Development

The results of the validation of this research data are based on validation from a material expert who is a lecturer from the Department of Law and Citizenship, a lecturer from the department of learning technology, a learning practitioner who is a Pancasila education teacher, 6 student responses to determine the initial response, and 28 student responses to determine the effectiveness of the Pancasila Adventure educational game.

The validation by material experts assessed three aspects: 1) content, 2) learning, and 3) language. The validation results carried out by the material experts can be seen in the following table:

a. Content aspects

Table 7 Results of Expert Validation of Content Aspects

No	Assessment criteria	x	xi	Percentage Score $0\frac{x}{x_i} \times 100$	Criteria
1	Conformity of learning outcomes with material	5	5	100	Very Worthy
2	Completeness of materials according to learning objectives	4	5	80	Worthy
3	Explanation of learning objectives at the beginning	5	5	100	Very Worthy
4	Details of material delivery	5	5	100	Very Worthy
5	Accuracy of material coverage	4	5	80	Worthy
6		5	5	100	Very Worthy

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
7	Explanation of the material in a coherent manner	5	5	100	Very Worthy
8	The accuracy of providing examples with the material presented	5	5	100	Very Worthy
9	Accurate placement of images and descriptions Presentation of material supports the achievement of expected competencies	5	5	100	Very Worthy
	Amount	43	45	96	**Very Worthy**

Source: Researcher (2025)

b. Learning aspects

Table 8 Results of Expert Validation of Learning Aspects

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
1	Presentation of material can motivate students to learn further	5	5	100	Very Worthy
2	The material in the media is arranged logically to facilitate the learning process.	4	5	80	Worthy
3	Presentation of material in media supports the development of students' critical thinking skills.	5	5	100	Very Worthy
4	This media facilitates students to learn independently	5	5	100	Very Worthy
5	Instructions in the media are clear enough to help students follow the learning flow.	5	5	100	Very Worthy
6	The evaluation (practice questions) presented are able to reflect the learning objectives.	5	5	100	Very Worthy
7	Media provides a fun learning experience	5	5	100	Very Worthy
8	Media provides a learning atmosphere that is not boring for students.	5	5	100	Very Worthy
	Amount	39	40	98	**Very Worthy**

Source: Researcher (2025)

c. Linguistic aspects

Table 9 Results of Expert Validation of Material for Linguistic Aspects

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
1	Use of language in accordance with good and correct Indonesian language rules	5	5	100	Very Worthy
2	The use of language is easy for students to understand	5	5	100	Very Worthy

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
3	The sentences in the media are arranged effectively	5	5	100	Very Worthy
4	There are no confusing words or phrases	5	5	100	Very Worthy
5	Capitalization, punctuation and spelling are in accordance with PUEBI	5	5	100	Very Worthy
4	The language used does not give rise to double meanings and multiple interpretations.	5	5	100	Very Worthy
5	Clarity of sentence structure (subject-predicate-object/description)	5	5	100	Very Worthy
6	The language style used is appropriate to the level of cognitive development of students	5	5	100	Very Worthy
	Amount	30	30	100	**Very Worthy**

Source: Researcher (2025)

Media expert validation assessed two aspects: 1) appearance and 2) programming. The validation results conducted by media experts can be seen in the following table:

a. Display aspect

Table 10 Results of Media Expert Validation for Display Aspects

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
1	The media has an attractive appearance	5	5	100	Very Worthy
2	Media can be used easily	4	5	80	Very Worthy
3	Media is able to convey material efficiently	4	5	80	Very Worthy
4	The text used is easy to read	4	5	80	Very Worthy
5	The displayed image is of good quality	4	5	80	Very Worthy
6	Placement of images in the media does not distract from the focus on the main material.	4	5	80	Very Worthy
7	The layout of the elements (text, images, buttons) is arranged in an orderly manner.	5	5	100	Very Worthy
8	The background and text colors have good contrast.	4	5	80	Very Worthy
9	Consistency of appearance between pages/slides in the media is well maintained	4	5	80	Very Worthy
10	The initial appearance of the media is interesting	3	5	60	Quite Decent
	Amount	41	50	82	**Very Worthy**

Source: Researcher (2025)

b. Programming aspects

Table 11 Results of Media Expert Validation for Programming Aspects

No	Assessment criteria	x	xi	Percentage Score $()\frac{x}{x_i} \times 100$	Criteria
1	This media allows active interaction between students and learning content. Navigation between menus is easy	4	5	80	Very Worthy
2	Feature selection is easily accessible	5	5	100	Very Worthy
3	Media can be used by students without	5	5	100	Very Worthy
4	special technical skills of the material. Instructions for using the media are clear	5	5	80	Very Worthy
5	The text displayed in the media is presented	4	5	80	Very Worthy
6	in a concise manner. Images used as needed	4	5	80	Very Worthy
7	The videos used support the content of the	5	5	100	Very Worthy
8	material.	4	5	80	Very Worthy
Amount		48	50	87	**Very Worthy**

Source: Researcher (2025)

The results of the validation of learning practitioners can be seen in the following table:

Table 12 Results of Learning Practitioner Validation

No	Assessment criteria	$\sum X$	xi	Percentage Score $()\frac{\sum x}{x_i} \times 100$	Criteria
1	Media can be used repeatedly	5	5	100	Very Worthy
2	The language used in the media is easy for students to understand	4	5	80	Worthy
3	The buttons in the media are clearly displayed.	4	5	80	Worthy
4	Instructions for using the media are written using simple language	4	5	80	Worthy
5	Navigation between menus can be done easily	4	5	80	Worthy
6	The installation process does not require complicated procedures.	4	5	80	Worthy
7	Media can run smoothly on the device	4	5	80	Worthy
8	Media can be accessed anywhere and anytime	5	5	100	Very Worthy
9	Media does not require large storage space (memory)	4	5	80	Worthy
10	The use of media can help increase students' enthusiasm in participating in the learning process.	5	5	100	Very Worthy
Amount		43	50	36	**Worthy**

Source: Researcher (2025)

Implementation

A small group trial was conducted involving six students of class X TPM 3 of SMK Negeri 2 Probolinggo. This activity was carried out in the classroom. During the implementation, students were asked to use the media independently with the guidance of the researcher, then provide responses through an assessment questionnaire. The results of the small group trial aimed to assess aspects of 1) product use, 2) media quality, and 3) language suitability.

Table 13 Student Responses to Small Group Trials

| No | Assessment Aspects | Score | | | | | Total Score |
		1	2	3	4	5	
Product Usage							
1	The media is easy to use without teacher assistance	-	-	1	2	3	26
2	Students can understand how to use media quickly	-	-	-	3	3	27
3	Students did not experience any difficulties when using this media for the first time.	-	1	3	1	1	20
4	The use of buttons in the media can work well	-	-	1	4	1	22
5	Navigation between menus/pages can be done easily	-	-	3	2	1	22
6	This media does not slow down my device	-	-	2	-	4	26
Media Quality							
1	The size of the letters (fonts) on the media is easy to read	-	-	-	1	5	29
2	The color of the letters on the media does not hurt the eyes	-	-	1	3	2	25
3	The type and size of letters in the media look neat	-	-	-	2	4	28
4	The menu, buttons and media content are arranged clearly.	-	-	1	3	2	25
5	The media display is not confusing	-	-	2	2	2	24
6	The background color is not painful to the eyes	-	-	-	-	6	30
7	The text can be read clearly	-	-	1	2	3	26
8	The images used in this media are clearly visible.	-	-		4	2	26
9	The position of the image and text do not overlap each other	-	-	2	1	3	25
Language Eligibility							
1	Explanation of the material using easy-to-understand language	-	-	1	3	2	25
2	Instructions for using the media are clearly stated.	-	-	1	4	1	24
3	There are no typos in the media	-	-	3	1	2	23
4	There are no confusing sentences	-	-	1	2	3	26
5	The language used is appropriate to the students' reading ability.	-	-	-	3	3	27

Source: Researcher (2025)

A large group trial was conducted involving 28 students of class X TPM 3 of SMK Negeri 2 Probolinggo. This activity was carried out in the classroom. During the implementation, students were asked to use the media independently with the guidance of the researcher, then

provide responses through an assessment questionnaire. At this stage the researcher provided an initial explanation regarding the purpose of the activity and guidelines for using the media. Next, students were given the opportunity to try it directly using their respective smartphones. The media was distributed by providing sheets of paper containing barcodes that could be scanned to open the learning media. Each barcode sheet was distributed to four students to make the media access process more efficient. After students tried the media, they were then asked to fill out an assessment questionnaire. The following is documentation of the implementation stage in the classroom. The results of the student questionnaire on the media are as follows:

Table 14 Student Responses to Large Group Trial

No	Assessment Aspects	Score					Total Score
		1	2	3	4	5	
Product Usage							
1	The media is easy to use without teacher assistance	-	-	8	11	9	113
2	Students can understand how to use media quickly	-	-	6	12	10	116
3	Students did not experience any difficulties when using this media for the first time.	-	2	8	11	7	107
4	The use of buttons in the media can work well	-	-	7	9	12	117
5	Navigation between menus/pages can be done easily	-	-	4	9	15	123
6	This media does not slow down my device	3	-	9	6	10	104
Media Quality							
1	The size of the letters (fonts) on the media is easy to read	1	-	5	8	14	118
2	The color of the letters on the media does not hurt the eyes	-	-	8	7	13	117
3	The type and size of letters in the media look neat	-	-	2	8	16	118
4	The menu, buttons and media content are arranged clearly.	-	-	6	6	16	122
5	The media display is not confusing	-	-	6	7	17	131
6	The background color is not painful to the eyes	-	-	3	5	20	120
7	The text can be read clearly	-	-	4	9	15	123
8	The images used in this media are clearly visible.	-	-	4	9	14	120
9	The position of the image and text do not overlap each other	-	1	5	8	14	119
Language Eligibility							
1	Explanation of the material using easy-to-understand language	-	-	4	8	16	124
2	Instructions for using the media are clearly stated.	-	1	5	8	14	119
3	There are no typos in the media	-	2	4	9	13	117
4	There are no confusing sentences	1	1	6	6	14	115
5	The language used is appropriate to the students' reading ability.	-	1	2	8	17	130

Source: Researcher (2025)

Evaluation

Media evaluation was conducted by analyzing media effectiveness data using descriptive quantitative methods to provide supporting images of the learning media's suitability through practice test questions after using the developed learning media. The practice test data was then

summarized in the form of an average score. The summary of the test results after using the Pancasila Adventure learning media can be seen in the following table:

Table 14 Evaluation Test Data

No	Test Results	Number of Students
1.	100	2
2.	98	1
3.	96	1
4.	90	3
5.	89	1
6.	87	2
7	86	1
8	85	1
9	84	3
10	83	1
11	82	1
12	81	2
13	80	6
14	75	1
15	74	1
16	60	1
17	58	1
Amount		28
Total Score		2,339
Average & Category		**83 (Effective)**

Source: Researcher (2025)

Based on the student learning outcome data, it was also obtained information that the highest score achieved by students was 100 and the lowest score was 58. The total test score obtained was 2,339 with a total of 28 students. Based on these values, the class average was 83. Based on the established assessment criteria, this average was categorized as good or "Effective".

DISCUSSION

The rapid development of digital technology in the 21st century has changed the learning paradigm in schools. Digital learning media are important because they create interactive learning suited to today's technology-savvy students. However, Pancasila Education is still often taught conventionally, which can hinder students' critical thinking skills. Research by Kusumawati et al., (2021) also shows that learning tends to be teacher-centered, making students passive and limiting the development of critical thinking.

Based on the urgency of the 21st century, innovation in learning, particularly in Pancasila Education, is needed, one of which is developing educational games. Games were chosen because they attract students and create interactive, challenging learning. Through games, students actively engage in problem solving and decision making rather than just receiving information passively. Furthermore, the use of educational games in learning can increase active student participation by making them more enthusiastic about participating in learning activities (Damarjati & Miatun, 2021; Kusuma & Dharma, 2024; Nurhikmah et al., 2024; Rambe et al., 2024; Siti Kurniawati et al., 2025).

The Pancasila Adventure educational game media product as one of the supports in learning Pancasila Education, as well as addressing the problems of students regarding learning Pancasila Education who have the assumption that learning Pancasila Education is less interesting because teachers still apply traditional methods based on lectures and textbooks. To address this, researchers attempt to restore students' less assumptions about learning Pancasila Education by arousing interest in learning by developing learning methods.

The product has been validated by subject matter experts, media experts, and learning practitioners, and piloted in small and large groups. The validation activity aimed to determine the validity of the developed media. At this stage, validators provided assessments, suggestions, and input on the developed learning media. The expert validation results were then revised to improve the developed learning media. The pilot test results were used to determine the product's feasibility and effectiveness.

The results of the analysis showed that the media was suitable for use, with the results of the material validator assessment being 97.6, and the results of the media validator assessment obtaining a value of 84. This is in accordance with the research Rianingtias, (2019) which states that the educational game obtained the first stage validation results of 77.50%, in the second stage after revision of 80.62% with the category "feasible". Meanwhile, in the material validation obtained a total percentage of test results in the first stage of 65.27% with the category "feasible", then in the second stage of the material validation test results the results were 81.24% with the category "very feasible". Research by Nurhikmah et al., (2024) also shows that interactive educational game media is declared valid and effective for use in learning. Students become enthusiastic and do not feel bored in learning. This is confirmed by the results of the study Damarjati & Miatun, (2021) also explained that the media validation results reached a percentage of 83.91%, and the feasibility results obtained a percentage of 89.44%.

The validator assessment by learning practitioners yielded a score of 36, indicating the media is highly suitable for use. These results demonstrate that the developed learning media is

not only suitable for use but also easy to operate and meets the needs of the classroom learning process. These research findings also align with the findings of the study Coal, (2022) which states that media is easy to use anywhere and anytime and its use does not require special skills. Practicality refers to the extent to which the media is easy to use, can be applied in real-life contexts, and is not time-consuming. Based on research conducted by Arisandy et al., (2021) regarding the development of educational game learning media with Construct 2 software assisted by Phet Simulation which is oriented towards students' creative thinking abilities, the results of the practicality obtained an average score of easy-to-use media of 3.67, the average score of content quality of 3.63, the average score of creative thinking indicators of 3.83. Thus, based on the results of the teacher assessment questionnaire, the media is categorized as practical to use.

The small group trial obtained a media feasibility score of 83, while the media feasibility score based on the assessment of the large group trial obtained a score of 84. This is in line with several other studies that examine educational games, such as research conducted by Tilova et al., (2025) stated that the majority of students, 87%, agreed that educational games helped them in their learning process. Students perceived educational games as a fun, interactive, and enjoyable learning activity. In line with this, Supandi & Gymnastics, (2019) he also stated that games can be a fun activity, as players strive to consistently win by completing the game. Naputri, (2016) states that students' thinking abilities are influenced by a strong interest in learning. A strong interest in learning will indirectly encourage students to be more active and develop their thinking skills in the learning process.

The media was also declared suitable based on the test results of the practice questions. The highest score achieved by students was 100 and the lowest was 58. The total test score was 2,339 with 28 students. Based on these scores, the class average was 83. Based on the established assessment criteria, this average is categorized as good or effective. These research results align with research conducted by Damarjati & Miatun, (2021)in a study entitled "Development of Android-Based Educational Games as a Learning Media Oriented to Critical Thinking Skills", which shows that the use of educational games oriented to the development of critical thinking skills can help students achieve the Minimum Completion Criteria (KKM), with a completion percentage of 78.26% based on critical thinking skills indicators. The development of the "Linear Program Adventure" game carried out by Damarjati & Miatun, (2021) it was found that 78.26% of 23 students were able to achieve the Minimum Competency (KKM) score. Therefore, the media is considered effective as a medium that can be applied in learning activities to train students' critical thinking skills, because the media is an independent learning medium that allows students to draw conclusions and understand the material independently.

Supriyatno, Susilawati, and Hassan (2020) states that effective learning media must be able to attract students' attention, facilitate conceptual understanding, and encourage critical thinking activities in the learning process. This perspective aligns with the demands of 21st-century education, which emphasizes mastery of Higher-Order Thinking Skills (HOTS), including the ability to analyze, evaluate, and create (Manik and Ngurah 2020; Setiawati 2019). The results of this study indicate that the Pancasila Adventure educational game, which is oriented towards critical thinking skills in tenth-grade students, is categorized as highly valid, very practical, and engaging. Validation from material experts, media experts, and practitioners indicates that the game's content, design, and interactivity aspects align with the learning objectives of the Pancasila subject.

In this context, the development of the Pancasila Adventure educational game was designed to create an interactive and challenging learning experience Admelia et al. (2022); Samin (2023). The "adventure" element in games can foster a fun learning atmosphere while stimulating active student engagement through completing missions and challenges at each level. This demonstrates that the use of game-based elements in learning serves not only as entertainment but also as a pedagogical strategy that integrates thinking, interaction, and experimentation into meaningful learning experiences.

Study by Arisandy, Marzal, and Maison (2021) this is relevant to the current research because both focus on the development of educational game-based learning media. While Arisandy's study used PhET Simulation with an orientation towards creative thinking skills, the current research developed the Pancasila Adventure educational game as a supporting medium for Pancasila Education learning. Both studies share similarities in implementing an interactive and engaging learning approach. Therefore, Arisandy et al.'s findings support the conclusion that educational games can be used practically and effectively as alternative learning media in the classroom.

Findings from Parwati, Sari, and Suharta (2025) this also supports the belief that learning media can create engaging learning experiences and motivate students to actively participate. During its development, the media was validated by material and media experts, achieving feasibility scores of 86% and 95%, respectively, both of which are categorized as highly valid. A pilot test with 16 students also yielded a score of 95%, indicating that the educational game-based learning media is considered highly suitable for use in the classroom.

Another study from Hidayat et al. (2023) showed that the application of game-based learning in Pancasila education created a fun learning atmosphere. Students were actively involved in the game process, thus making the learning experience more engaging and increasing

their participation throughout the lesson. Further research was conducted by Nugraha, Zen, and Rayendra (2025) the study also confirmed that Android-based digital learning media is a viable and effective learning tool, capable of enhancing student understanding and engagement through multimedia features such as audio, video, images, and animation. This study provides an innovative digital learning solution with the potential to serve as a model for other educational subjects.

CONCLUSION

Based on theory and field trials, it can be concluded that the Pancasila Adventure educational game is suitable for use and aligns with the objectives of developing innovative learning media. This media has several advantages that support student learning. First, this media can be accessed anywhere and anytime independently. Second, this media is relatively easy to operate because it has been designed with a simple interface accompanied by clear instructions, with the hope that both students and teachers can use it without difficulty. Third, this media is also equipped with various multimedia elements such as images, videos, and audio, which make the media display more attractive and help students understand the material more interactively. Fourth, this media is also equipped with evaluations or practice questions that can be used even without an internet connection.

However, the educational game learning media developed also has several shortcomings. First, it can only be operated on smartphones with the Android operating system, so students using other operating systems, such as iOS, cannot access it. Second, in the practice questions section, the media does not provide answer explanations that can help students understand the rationale for correct answers. Furthermore, the material presented in the media is still limited to a single topic: the history of the birth of Pancasila. Therefore, future developers need to add answer explanation features, expand the material coverage, and develop it for other operating systems, such as iOS.

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