

Innovation in Multimedia Learning Media Based on the PandaiQu Application in Pancasila Education to Improve Student's *Critical Thinking Skills*: Toward 21st Century Learning Transformation

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Abstract

This study explores the PandaiQu application-based multimedia learning media as an educational innovation in Pancasila Education. The objectives of this study are: (1) To examine the characteristics and potential of the PandaiQu application as an innovative multimedia learning tool in Pancasila Education, and (2) To analyze the relevance of using the PandaiQu application in improving student's critical thinking skills in Pancasila Education. This study uses a descriptive method based on a literature review with data collection through literature review and data collection instruments through document analysis from various relevant scientific journals, books, and proceedings. The research subjects were focused on high school students to obtain an initial picture of user perceptions and needs. The research findings show that: (1) The use of PandaiQu application-based multimedia learning media shows characteristics and potential that support its function as an interactive, accessible, and dynamic educational tool that is capable of presenting learning materials and encouraging active student involvement, and (2) The PandaiQu application is relevant in supporting the improvement of student's critical thinking skills in Pancasila Education. This study concludes that the PandaiQu application-based multimedia learning media is an interactive innovation in Pancasila Education that effectively encourages student's critical thinking and contributes to building 21st century learning competencies.

Keywords: Multimedia Learning Media; Pancasila Education; Critical Thinking Skills

Introduction

Education is the result of an institution's efforts to channel and develop good competencies in students, as well as to foster full awareness of social issues and the student's own relationships (Ujud, Nur, Yusuf, Saibi, & Ramli, 2023). Based on this definition, education becomes an effort to create an environment and learning process for students that can develop their potential. The 21st century demands educational competencies that integrate knowledge, skills, disposition, and mastery of information and communication technology (Niyarci, 2022).

Thus, in the 21st century, these 21st Century Skills encourage humans to be proficient in various aspects, such as forming and developing more critical, creative, intellectual, and characterful skills in everyday life. 21st century skills in education will also nurture humans to adapt to technology, a concept that has become ingrained in the era of society 5.0.

Pancasila education is a subject taught in schools from elementary to university level (Nurgiansah, 2021). The existence of Pancasila Education as a subject, which has undergone various name changes until the current name was established, is a step in improving the curriculum while also shaping

student's civic knowledge. The learning objectives of Pancasila Education are for students to acquire various competencies, including critical, creative, and rational thinking skills to deal with various issues (Putri, Dewi, & Furnamasari, 2024). However, the world of education in Indonesia still faces many gaps between the competencies required in the 21st century and the teaching methods currently used by teachers in the classroom. *Critical thinking* skills should be an essential skill that students master during the learning process. However, the reality based on previous research by (Siahaan & Meilani, 2019) found that tenth grade students at one of Bandung's public high schools demonstrated low *critical thinking skills*, with a score of 46.60. This is in line with previous research by (Pitri & Anderson, 2023) at SMP Negeri 16 Tebo, it was found that during the Civic Education learning process in grade VIII, there was still no development in *critical thinking skills* because teachers still used conventional learning methods or lectures. The presentation of material during the learning process using the lecture method often made students passive and less actively involved during the learning process, so that the objectives of forming critical and reflective characters would be difficult to achieve. With various problems still frequently encountered, it will be a challenge to achieve success in the learning process for students in Pancasila Education. If education faces various challenges and needs in the 21st century, then utilizing digital technology is one of the steps in achieving the learning objectives in Pancasila Education, where there needs to be an emphasis on learning to develop student's *critical thinking skills*.

According to Ally in (Ayuwulandari, Susilawaty, & Nur, 2025) states that the development of digital content requires special expertise and resources that may pose obstacles and challenges in schools and educational institutions. Despite the many challenges encountered, strong collaboration between teachers and students in adapting digital technology in learning can yield positive results and prepare them to face the developments of the digital age. The increasingly complex, dynamic, and modernized transformation of education in the

21st century, based on technology, will be a great opportunity to support successful learning, one of which is by using interactive digital-based learning media. The use of interactive learning media, ICT, games, simulations, and project-based learning methods are examples of methods that can be applied in innovative learning with the hope of helping students understand various concepts much better, improving *critical thinking skills*, and increasing student activity during the learning process (Aisyah & Ramadhan, 2023). As previous researchers have done oleh (Zulfaidah, Nasir, Dhayinta, & Wacana, 2025) states that the use of AI-based learning media can contribute to improving student's *critical thinking skills* in civic education learning.

In addition, other research presented by (Yulianti, Alif Aditya Candra, & Siti Tiara Maulia, 2025) states that cartoon-based animated learning media using the Tiktok application can improve the *critical thinking skills* of students at X.E1 SMAN 4 Kota Jambil, with 94% of students in the class achieving a "very critical" rating. Therefore, this learning media has great potential as a solution to various problems encountered during the learning process in Pancasila Education lessons. From this context, the researcher discovered the innovation of multimedia learning media based on the PandaiQ application, which is able to meet educational needs. This application is the latest application that has never been developed by anyone and is designed as interactive multimedia learning media that presents text, audio, video, and various other elements with the hope of creating an interesting learning experience and stimulating students to think critically. In line with the views of (Muhammad Yulfikar Akmal, R. Mursid, 2018) The development of multimedia requires mastery of several contexts such as design in communication, video editing, photography, graphic design, graphic layout, visual communication design, and computer technology skills.

The introduction of the PandaiQu application-based multimedia learning innovation by researchers should enable the application to integrate learning approaches for students in order to improve their *critical thinking skills* while also becoming a

breakthrough in renewable learning media for Pancasila education. Thus, it is very important to conduct an in-depth study of the characteristics and potential of the PandaiQu application and the usefulness of this learning media in improving student's *critical thinking skills*.

Literature Review

According to Newby, Stepich, Lehman & Russel in (Kristanto, 2016) learning media is something that can convey messages to achieve learning objectives. Learning media is not only a visual learning aid, but can also be an interactive tool that integrates multimedia-based technology, pedagogy, and learning content. Good media should be effective in transferring material quickly so that students can improve their understanding of the material efficiently, meaning that the media should be simple and practical (Tahajudin, D. Rahayu & Fadliansyah, 2023). Thus, learning media is relevant for education in the modern 21st century..

Multimedia is a form or component that combines technology that can be used in education to support the various needs of teachers and students with different cognitive abilities. According to (Mayer, 2001), There are three concepts of multimedia, including: *First*, the technical level as a vehicle for transporting signs; *second*, the semiotic level related to its forms (text, images, and graphics); and *third*, the sensory level, which is the channel that can receive signs. In a multimedia application, you can control the existing features or elements. Therefore, multimedia learning media is a learning program that presents integrated elements to achieve learning objectives. According to (Nurgiansah, 2021), Pancasila Education is a compulsory subject taught at all levels of education, from elementary school to university. Previously known as PPKn, Pancasila Education has undergone changes that are not only cognitive in nature, but also serve as a medium for shaping student's character in accordance with the values of Pancasila.

According to (Ariadila, Silalahi, Fadiyah, Jamaluddin, & Setiawan, 2023) *Critical Thinking Skills* are a form of ability to process

and evaluate information received objectively in order to reach the right decision. This is also an essential skill that students must master during their learning. The learning process to improve student's *Critical Thinking Skills* can be carried out in several ways, such as problem-based learning, reflective learning, and collaborative learning. The skills possessed by students will provide them with knowledge that not only covers the material that has been delivered, but also improves their critical analysis skills.

Education in the 21st century is said to be an era that greatly facilitates learning that utilizes technology for the learning process of students in schools. In the 21st century, learning has its own characteristics, designed based on the 4C, namely: *critical thinking skills*, creative and innovative thinking skills, communication skills, and collaboration skills (Fetra Bonita Sari, Risda Amini, 2020).

Method

The method used in this study is descriptive, with data collected through literature review. This approach is intended to provide an in-depth and systematic description of the innovation of PandaiQu application-based multimedia learning media in Pancasila Education, as well as to examine the relevance of the PandaiQu application in improving student's *critical thinking skills*. The method used as a step for researchers to interpret in detail the characteristics, potential, and relevance of the application. The assessment also aims to build a comprehensive understanding through description and in-depth analysis with data collection through literature review.

According to (Marzali, 2016), literature review is a form of research or library research through reading various journals, books, and other publications that still contain topics from research to produce a paper related to a particular issue or topic. In line with Sugiyono view in (Puspitasari, 2019), literature study is defined as a form of theoretical study and other references related to values, culture, and norms that are developing in the social situation being studied. Using this method, researchers can describe in depth how the

design, features, elements, and content of the PandaiQu application are aligned with the learning needs of the 21st century. In collecting the data used in the research, researchers carried out various stages, including collecting data from various journals, books, scientific articles, and proceedings. The next stage involved reading and analyzing various literature that had been studied, focusing on the relevance of the research subject and other supporting factors for further study. The literature review will also enable researchers to identify and compare findings as well as the strengths and limitations of previous findings. The research subjects were focused on high school students to obtain an overview of user perceptions and needs, considering that the current stage of education requires students to be more complex in their cognitive development phase, which demands the ability to develop critical, analytical, and reflective thinking skills. This selection is also based on the consideration that high school students are a generation that is very familiar with digital technology, so that the use of multimedia learning applications such as PandaiQu, which has been designed and created, can be more easily integrated into their learning activities..

The research method used is expected to produce a comprehensive understanding of the design of PandaiQu application-based multimedia learning media as a learning innovation and provide practical recommendations for Pancasila Education teachers at the high school level and researchers as media developers in realizing interactive, contextual, and oriented learning to improve student's *critical thinking skills* in the era of 21st century educational transformation.

Result and Discussion

Characteristics and Potential of PandaiQu Application as an Innovative Multimedia Learning Tool in Pancasila Education

A The PandaiQu application is an application-based learning medium that has been specifically designed and developed by researchers to support interactive learning in Pancasila Education subjects. The PandaiQu application is designed to fully integrate 21st

century learning needs with principles that emphasize active engagement and foster critical thinking in students. As an application-based learning medium, PandaiQu integrates components such as text, audio, video, and interactive elements into a structured platform. The features are designed to suit the needs and learning styles of students and encourage active engagement in the positive use of technology. This application was developed by combining the principles of multimedia learning with a student-centered approach, with the hope of facilitating interaction in the form of technology, collaboration, and critical reflection. The following are some of the characteristics of the PandaiQu application-based multimedia learning media:

1. The PandaiQu application is specifically designed for Pancasila Education subjects at the high school level.

The PandaiQu application-based multimedia learning media is designed to support student learning success in Pancasila Education subjects in an era of modernization that adopts various technologies. This design is made into an application that is different from other learning platforms, which is formed and designed as optimally as possible in accordance with its objectives, namely to shape student's cognitive abilities while improving their *critical thinking skills*. The use of this application provides a new alternative to overcome the limitations of conventional learning, which often fails to stimulate active student participation. As a learning medium modified for Pancasila Education at the high school level, the PandaiQu application emphasizes technology-based learning that is in line with the demands of 21st century learning, namely fostering student's competence in critical, collaborative, communicative, and creative thinking..

2. Instructions for using the PandaiQu application can be accessed

Instructions for using the application will be accessible once you have downloaded and accessed the PandaiQu application. This guide not only helps you understand the features available in the application, but also educates you on digital literacy based on the application.

3. PandaiQu's simple yet intuitive application design

The PandaiQu application based multimedia learning media provides students with an alternative to digital learning by presenting a clear display, easy navigation, and clear and bold icons. Thus, the application can be utilized during the learning process in accordance with student's learning needs. Although the simple design can improve accessibility, the challenge of ensuring simplicity does not reduce the depth of the material or the variety of interactive features to support successful learning in Pancasila Education.

4. The PandaiQu application integrates various learning features, including: Biodata, Grade List, Discussion, Assignments, Materials, Attendance, Criticism & Suggestions, and so on.

The features provided in this application are a holistic approach to supporting the learning process, which can be explained as follows:

- a) Biodata: As a list of student identities and personalized learning
- b) Grade List: Providing transparency of learning outcomes to students, with the hope that this will motivate students to reflect on their learning.
- c) Discussion: Becoming an interactive space for students to hone their argumentation and collaboration skills, thereby stimulating students.
- d) Assignments: Becoming a space for efficient digital assignment collection and can be used as an assessment facility.
- e) Materials: Becoming a space that provides multimedia content that can broaden student's understanding by providing text, images, and videos as needed.
- f) Attendance: A space for recording student attendance lists and backing up data online.
- g) Criticism & Suggestions: Becoming a space for communication between developers, teachers, and students, thereby serving as a platform for improvements according to future needs.

Referring to the statement by (Mukhtar, 2018) states that learning media must be considered in terms of the medium, instructions, and tools that will be used to convey a message during learning. Thus, learning media has several main functions, namely: stimulate student activity or interest, deliver messages or information, and provide technology-based teaching. The following is an outline of the PandaiQu application and its various features.

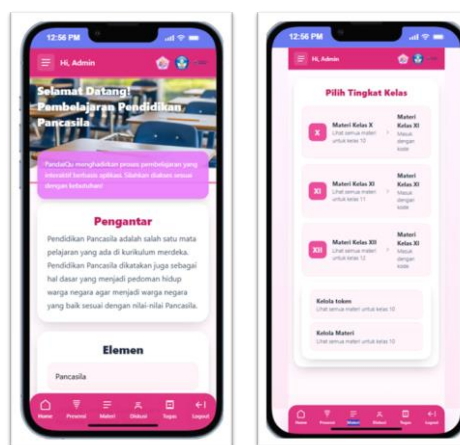


Figure 1. PandaiQu Application-based Multimedia Learning Media

The PandaiQu Application-based Multimedia Learning Media has significant potential as a sustainable learning innovation, as researchers designed the application with the hope of accommodating learning needs in the 21st century, one of which is to improve student's *critical thinking skills*. Some of the potential applications include:

1. Actively involving student
The PandaiQu app offers several features to encourage students to present arguments through the material contained therein while improving their digital literacy. It can train their analytical and evaluation skills through assignments and tests within the app.
2. Encouraging reflective learning
The PandaiQu app will provide a space for joint reflection, evaluation, and fostering awareness for independent learning.
3. Providing contextual learning
The PandaiQu application will package multimedia content so that teachers can present various teaching materials

according to the needs and learning styles of their students.

4. Enriching the learning space for teachers and students

The PandaiQu app facilitates unlimited learning for teachers and students. This makes it easier for students to learn by accessing materials, discussing, and completing assignments outside of class hours.

The advantage of the PandaiQu application lies in integrating learning and interaction functions into an application-based multimedia learning platform for Pancasila Education. Compared to conventional learning methods, PandaiQu offers flexible learning and provides students with more space to build their knowledge collaboratively.

The Relevance of Using the PandaiQu Application in Improving Student's Critical Thinking Skills in Pancasila Education

In the use of PandaiQu application-based multimedia learning media and based on several literature reviews and conceptual analyses, the application is relevant for shaping and improving student's *critical thinking skills* in Pancasila Education learning. This is in line with the principles of learning in the 21st century, which prioritize higher-order thinking skills. The media was designed and developed by researchers as interactive multimedia learning media containing components in the form of text, images, audio, video, and so on. The features included also support students in generating stimuli. The use of the PandaiQu application means that students do not receive information passively, but also build cognitive understanding through interaction with the features contained in the application.

In addition, PandaiQu can be said to be relevant for improving *critical thinking skills* based on its content. This can be found in the material and assignment features. The teaching and learning process will not be effective if learning media is not utilized, as media is an important component of learning (Indriani, Dewi, & Furnamasari, 2021). Both features in the PandaiQu application, the overall material and tests, are designed and presented based on

the learning outcomes to be achieved. The content will not only be provided, but the material and assignments will be presented in the form of current issues that can stimulate students to think critically and express their arguments in their own words. PandaiQu is presented as a digital learning innovation without adapting existing applications, thus having uniqueness in its orientation, design, and function. If you want to explore further into the design of multimedia learning media based on the PandaiQu application, it can be explained as follows

1. Interactive Design of the PandaiQu Application

The PandaiQu application is designed as well as possible to enable students to actively interact during the Pancasila Education learning process. Support from the presentation of text, audio, audio-visual, illustrations, and other elements by linking real issues can provide students with a learning space to explore various existing issues. The use of interactive learning media technology stimulates all of the student's senses, thereby maximizing their absorption of the material (Dian, Fitriah, Tyara, & Arita, 2022). Thus, learning based on the PandaiQu application is transformative in nature, where students are involved in the process of critical thinking through digital means.

2. Supporting students in personalized learning

The PandaiQu application was designed to provide students with the opportunity to learn according to their learning style and pace of understanding. The features in the application are expected to encourage students to develop arguments, provide feedback by comparing perspectives, and draw conclusions. In line with the previous argument, Kontrimiene in (Winarno, 2024) Personalized learning is a shift from students obtaining information through independent channels such as books and library reading rooms to students shaping themselves and taking responsibility for their own progress. Personalized learning enables students to continue learning after formal schooling has ended. Of course,

the features presented in the application are relevant to the goal of improving student's *critical thinking skills*.

3. Supporting the implementation of materials through digital means

The PandaiQu application bridges Pancasila education materials with students through digital technology. Amidst the rapid flow of information and technological disruption, the application serves as an educational and positive learning medium that integrates not only material content, but also practices Pancasila values while strengthening student's digital literacy.

4. Supporting learning Teachers as learning facilitators

The PandaiQu Application based Learning Media can help Pancasila Education Teachers monitor the learning process of students through the discussion, assignment, and interactive evaluation features available in it. That way, Pancasila Education teachers not only assess the final results of student learning, but also strengthen student's arguments and critical thinking during Pancasila Education learning.

Therefore, the use of application-based learning media through Android and other digital devices can provide a direct experience and direct involvement for the student's themselves. The involvement of the student's senses will be able to provide a complete impression of the information obtained (Yamin & Harmanto, 2020). However, the PandaiQu application is still a newly designed product and has not been used by anyone, so this assessment is based on several literature reviews through the collection of data relevant to the topic. Of course, the PandaiQu application is also the latest learning media innovation and can be an alternative for students to learn extensively and can be accessed without time limits.

Conclusion

The PandaiQu application is an innovative multimedia learning medium specifically designed to support Pancasila education in an interactive, flexible manner that is suited to the needs of the 21st century.

Through studies conducted by researchers who designed and innovated multimedia learning media based on the PandaiQu application to improve student's critical thinking skills, the following conclusions can be drawn:

1. The PandaiQu application learning media has strong characteristics and potential by combining various components and elements in the form of text, audio, video, images, and others. The available features are not only learning tools, but also enable students to actively participate, think critically, and reflect through the use of the PandaiQu application. The main potential of the PandaiQu application lies in its ability as an innovative multimedia learning medium that can encourage student activity and improve critical thinking in accordance with the learning needs of Pancasila Education in the digital age.
2. The use of the PandaiQu application as an innovative multimedia learning medium in Pancasila Education shows potential relevance in supporting the improvement of student's *critical thinking skills*, as required in the 21st century. This is demonstrated through its ability to present content that requires analysis, reflection, and deeper cognitive involvement.

Thus, conceptually, the PandaiQu application is relevant for improving student's *critical thinking skills* because it is designed systematically in line with the transformation of 21st century education. This relevance is still prospective, so further research can be conducted through subsequent trials to measure its feasibility and effectiveness more comprehensively.

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