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Enhancing Pancasila Student Profiles: Android-Based Learning Media in the Independent Curriculum for Elementary Schools

Hadi Purwanto[1], Yessy Yanita Sari[2], Somariah Fitriani[3]

[1] Universitas Muhammadiyah Prof.DR. HAMKA, Indonesia; hadipurwantosdn10@gmail.com
[2] Universitas Muhammadiyah Prof.DR. HAMKA, Indonesia; yessy.syah@uhamka.ac.id
[3] Universitas Muhammadiyah Prof.DR. HAMKA, Indonesia; somariah@uhamka.ac.id

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ABSTRACT

This study focuses on the development and evaluation of Android-based learning media designed to integrate the Pancasila Student Profile into the Independent Curriculum for elementary schools. The media aims to enhance character education and support digital-era learning. A research and development (R&D) approach was employed, utilizing the Four-D model, encompassing the Define, Design, Develop, and Disseminate stages. Validation was conducted by media and content experts, followed by trials with fourth-grade students. Data collection included expert assessments, student feedback, and comparative analysis of learning outcomes in experimental and control classes. Validation by media experts yielded an average score of 4.7, and content experts gave an average score of 4.47, both classified as "very feasible." Student feedback also supported the media's effectiveness, with an average score of 4.55, similarly rated as "very feasible." Experimental trials demonstrated a significant improvement in learning outcomes, with an N-gain of 0.73 (high category) for the experimental class compared to 0.28 (low category) for the control class. The findings indicate that the Android-based learning media effectively enhances students' understanding of the Pancasila Student Profile while addressing broader goals of character education. The significant improvement in learning outcomes highlights the potential of technology-based learning tools in implementing the Independent Curriculum. This study contributes to educational research by demonstrating the feasibility and effectiveness of integrating character education into technology-based learning. The media serves as a valuable resource for advancing Independent Curriculum objectives in elementary schools.

Corresponding Authors:
Hadi Purwanto
Universitas Muhammadiyah Prof.DR. HAMKA, Indonesia; hadipurwantosdn10@gmail.com

1. INTRODUCTION

Education plays a pivotal role in shaping the character and identity of a nation (Pradana, Mahfud, Hermawan, & Susanti, 2021; Qazi & Shah, 2019; Imants & Van der Wal, 2020). Character education is a crucial element in preparing future agents of change who can contribute to the nation's prosperity (Hafizi, 2023). It is also recognized as a key factor in shaping individuals with broad perspectives and the capacity for success (Sari, Zulaiha, & Mulyono, 2020). Beyond fostering personal achievement, character education instills moral values, guiding students toward becoming individuals of integrity and principle (Metcalfe, Kristjánsson, & Peterson, 2023).

In Indonesia, the integration of Pancasila values into education remains a cornerstone of the national curriculum, emphasizing the cultivation of character and integrity to build a strong, value-driven generation (Amelia et al., 2023). However, challenges persist in embedding these values within the Merdeka Curriculum, particularly at the elementary school level. Despite Pancasila's long-standing role as the philosophical foundation of Indonesian education, there is an increasing need for innovative and effective learning strategies to strengthen students' understanding and application of these values. This gap highlights the urgency of developing approaches that not only align with contemporary educational demands but also ensure the sustainability of character education rooted in Pancasila principles.

The Pancasila Student Profile reflects Indonesian students as lifelong learners with global skills and behaviors that embody the values of Pancasila, including faith in and devotion to God Almighty, noble character, global diversity, collaboration, independence, critical thinking, and creativity. (Kemendikbud, 2021). Within the context of the Merdeka Curriculum, the implementation of these six dimensions of the Pancasila Student Profile serves as a moral and spiritual foundation for students, leading to the development of integrity, social responsibility, and a commitment to justice. This study is motivated by the need to develop learning media that align with the spirit of the Merdeka Curriculum, particularly in the context of Pancasila values by teachers and supported by school principals. As mentioned by Fatimah, Fitriani, and Priyono (2024), to achieve the Pancasila Student Profile, the development of outstanding human resources must start with capable and proficient teachers and visionary school leaders.

Digital learning media have become a central focus in the context of modern education. (Sarker, Wu, Cao, Alam, & Li, 2019). Recent studies indicate that the use of digital learning media has a positive impact on enhancing student engagement and learning effectiveness. (Puspitarini & Hanif, 2019; Wu & Chen, 2020; El-Sabagh, 2021). Digital media can invigorate the classroom atmosphere, encourage student discussions, facilitate the delivery of content, aid in student comprehension, and make the teaching and learning process more effective and efficient. (Aini, Kumalasani, & Kusumaningtyas, 2023). Well-designed digital learning media can facilitate student understanding by utilizing visual, audio, and interactive elements (Lin, Chen, & Liu, 2017). This creates a more engaging and adaptive learning environment, allowing students with different learning styles to respond to educational material more effectively. Technology plays a role in expanding students' access to digital learning resources to ensure equity in educational opportunities (Kilag et al., 2023). The integration of information technology also enables broader access to education without geographical limitations. High-quality educational resources can be shared online, providing all students with the opportunity to benefit from quality educational materials (Xing, 2022). Through the use of applications, software, and online learning platforms, students can access learning materials from anywhere and at any time, supporting the concept of lifelong learning (Herwin, Nurhayati, & Dahalan, 2022).

In the technological era, Android-based learning approaches have become a relevant alternative to support the learning process. The use of Android-based learning media can create a more meaningful and interactive learning experience, enhancing the effectiveness and efficiency of the learning process, while also stimulating students' thinking, emotions, attention, and skills (Ruswan et al., 2024). Learning by integrating technology is one approach in constructivist learning that aims to build their insights and knowledge. The constructivist approach is applied to students so that they can be actively involved

in forming their knowledge (Suoth, 2019). In addition, the design of this media strongly adopts the student-centered learning approach, which places students at the center of the learning process. This approach provides flexibility for students to determine the pace and sequence of learning according to their needs. Intuitive navigation features allow students to explore the material independently, while multimedia elements such as animation and audio support a variety of learning styles. By giving students choice and control, this application creates a personalized and relevant learning experience (Stann & Desmiwati, 2019). The 2020 Indonesian Child Protection Commission (KPAI) survey noted that 71.3% of students already have personal devices.(KPAI, 2020)Statistics released show that the market share of Android operating system users in Indonesia reached 89.04% in February 2024 (Gs.statcounter.com, 2024). Internet penetration in Indonesia will reach 79.5% in 2024, with penetration in the 5-12 age group at 62.34% (Arif, 2016). In this context, the development of Android-based learning media that contains Pancasila values is very relevant, considering the large role of these national values in shaping the character of the younger generation.

Android technology offers significant potential for creating engaging, interactive, and relevant learning experiences that meet the needs of today's students. A study has shown that the use of technology, along with collaborative and interactive group activities, can positively influence student engagement (Ullah & Anwar, 2020). Android-based applications enable the integration of various multimedia features that can capture attention and facilitate a more dynamic understanding of Pancasila concepts. The interactivity provided by Android technology plays a crucial role in enhancing student participation in the learning process and activating critical thinking in a flexible and interactive manner (Irfana, Hardyanto, & Wahyuni, 2022). Given these challenges, it is essential to conduct research on the development of Android-based learning media that incorporates the Pancasila Student Profile. The advancement of technology-based learning media facilitates teachers in delivering content to students. One study has shown that the use of technology, along with collaborative and interactive group activities, can positively influence student engagement (Ullah & Anwar, 2020). Other studies have also developed Android applications focusing on Pancasila values (Rosana, Setyawarno, & Setyaningsih, 2019; Qoidah & Paksi, 2021; Septiani, Rejekiningsih, Triyanto, & Rusnaini, 2020). However, many of these applications have not fully integrated the Pancasila Student Profile or are limited in their capacity to strengthen character education to support the successful implementation of the Merdeka Curriculum. This research aims to produce innovative learning media that meet the educational needs of Pancasila in the era of the Merdeka Curriculum, enhancing students' understanding and application of Pancasila values in elementary schools.

2. METHOD

2.1 Research Design

This study was conducted within the framework of research and development (R&D) adapted from the Four-D development model (Thiagarajan, 1976), which comprises four stages: Define, Design, Develop, and Disseminate. This development method utilizes the Borg and Gall model, aiming to create and verify educational products through a series of phases. These phases include analysis, development, testing, and product revision (Gall, Borg, & Gall, 2003). Subsequently, the evaluation stage was carried out using a mixed methods approach (Creswell, 2014).

2.2 Research Subjects and Participants

The research subjects comprised both media validation subjects and trial subjects. The media validation subjects included two media experts and two content experts. The limited trial involved 10 students as participants, while the field trial included 60 fourth-grade students from a public elementary school in Jakarta during the 2023/2024 academic year. For ethical consideration, we informed school principal, students and teachers about the objective of the study, the benefits of the

research and possible valuable outcomes. We requested all participants to participate in our study voluntarily.

2.3 Data Collection

Data were collected through observation, and survey questionnaires were tested for validity and reliability with 30 respondents before being distributed to fourth-grade students in Jakarta. The data were processed using descriptive analysis and regression tests with SPSS version 25.00, and pretest-post-test analyses (Morgan, Barrett, Leech, & Gloeckner, 2019). Validation by media and content experts was conducted using a rating scale with Aiken's V index for validity and Cronbach's Alpha for reliability (Aiken, 1985; Cronbach, 1951). This method aims to provide a comprehensive understanding of the effectiveness of the Android-based learning media incorporating the Pancasila Student Profile in the implementation of the Merdeka Curriculum in elementary schools.

2.4 Data Analysis

The feasibility of using media in learning is determined based on the media quality category. Media is considered feasible if it achieves at least a "good" quality category. The media quality category is derived from the results of media validation and the assessment of media quality during the small-scale class trials and field trials. The media quality assessment data is quantitative, using a scale of 1-5. This data is analyzed by calculating the average score for each aspect of the assessment. The average score is then compared to the media quality categories (Widoyoko, 2017) as presented in Table 1.

Table 1. Learning Media Validation Criteria

Score	Category
>4.20 to 5.00	Very good
>3.40 to 4.20	Good
>2.60 to 3.40	Fair
>1.80 to 2.60	Not good
1.00 to 1.80	Not too good

The analysis of student responses was developed and measured using a Likert scale questionnaire, where values 1-5 represent the categories Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). The data obtained consists of qualitative data collected from student response sheets based on these criteria. The effectiveness of the media was measured using pretest and post-test scores and analyzed using normalized gain (N-gain) (Hake, 1998). The criteria for media effectiveness are presented in Table 2.

Table 2. Media Effectiveness Criteria

Profit Value N	Criteria
<g> ≥ 0.7	High
0.7 > <g> ≥ 0.3	Currently
< 0.3	Low

3. FINDINGS AND DISCUSSION

3.1 Define

At the defining stage, an analysis was conducted to identify the development needs in accordance with the Four-D R&D model (Thiagarajan, 1976). The researchers analyzed these needs by distributing questionnaires to 100 teachers in the Jakarta area to identify the requirements and objectives for developing Android-based learning media incorporating the Pancasila Student Profile. The results indicated that the majority of elementary school teachers in the DKI Jakarta region were already familiar with the Pancasila Student Profile in the Merdeka Curriculum, with 90% of teachers reporting familiarity with the concept. Additionally, 80% of teachers believed that Android-based learning media

could enhance students' understanding of the Pancasila Student Profile, although only 40% had ever used Android-based learning media in their teaching activities. A significant majority (96%) of teachers felt it was important to integrate the Pancasila Student Profile into Android-based learning media in elementary schools, and 84% agreed that this technology motivates students. Furthermore, 94% of teachers supported the development of Android-based learning media incorporating the Pancasila Student Profile.

3.2 Design

The product planning phase involved designing the product in the form of a flowchart and storyboard. The flowchart outlines the navigation flow for operating the learning media on Android devices, serving as a blueprint for user interaction. The storyboard, functioning as a visual script, provides a detailed outline for the creation of the learning media, depicting the arrangement of images, text, effects, animations, audio, and other components on the media's screen. During the product planning stage, various components were developed, including content, animated videos, comics, evaluation questions, and interactive games. The media selection utilized tools such as Android Studio, Canva, Pixton, CapCut Pro, and Filmora to integrate various types of media. The initial design phase included content design using flowcharts and storyboards, as well as multimedia production in accordance with Android Studio standards to ensure the application's quality.

3.3 Developing

To ensure the quality and feasibility of the developed learning media, we conducted a validation process involving two media experts. This validation covered four main aspects: Ease of Use and Navigation, Visual Communication, Media Integration, and Programming. The following are the average scores provided by the media experts, as shown in Table 4.

Table 4. Media Expert Validation Results

No	Validator	Aspect				Average score
		Ease of Use and Navigation	Visual communication	Media Integration	Programming	
1	Media Expert 1	4.8	4.6	4.8	4.8	4.75
2	Media Expert 2	4.8	4.6	4.6	4.6	465
Average score		4.8	4,6	4,6	4,6	4.7
Category		Highly Feasible	Highly Feasible	Highly Feasible	Highly Feasible	Highly Feasible

Based on the evaluation results, the overall average score given by the media experts is 4.7, categorized as "Highly Feasible." This indicates that the developed learning media has met high standards in terms of ease of use, visual communication, media integration, and programming. Next, to assess the quality and relevance of the developed learning content, validation was conducted by two content experts. The following are the average scores provided by the content experts, as shown in Table 5.

Table 5. Content Expert Validation Results

No	Validator	Aspect					Average score
		Content Relevance	Content Presentation	Language	Content effectiveness	Evaluation	
1	Content Expert 1	5	4.4	4.6	4.4	4	4.48
2	Content Expert 2	4.6	4.6	4.2	4.4	4.5	4.46
Average score		4.8	4.5	4.4	4.4	4.25	4.47
Category		Highly Feasible	Highly Feasible	Highly Feasible	Highly Feasible	Highly Feasible	Highly Feasible

Based on the assessments from Content Expert 1 and Content Expert 2, the overall average score given by the content experts is 4.47, categorized as "Highly Feasible." This consistently indicates that the learning material is not only relevant to the learning objectives but is also well-presented, uses appropriate language, is effective in achieving learning goals, and includes adequate evaluation. It can be concluded that the learning material is highly suitable for use in the learning process. To assess students' perceptions and experiences with the developed learning media, we collected responses from students regarding several key indicators. The following are the average scores and their categories based on student responses, as shown in Table 6:

Table 6. Student Responses

Indicator	Average Score	Category
Usage & Navigation	4.5	Highly Feasible
Visual	4.7	Highly Feasible
Media Integration	4.6	Highly Feasible
Language	4.4	Highly Feasible
Content Relevance	4.6	Highly Feasible
Evaluation	4.6	Highly Feasible
Programming	4.5	Highly Feasible
Average Score	4.55	Highly Feasible

Based on these results, it can be concluded that this learning media is highly suitable for use in the learning process. Data collection to measure student learning outcomes was conducted in both the control class and the experimental class. In the experimental class, students were given treatment in the form of using the learning media, while in the control class, students received instruction through conventional methods.

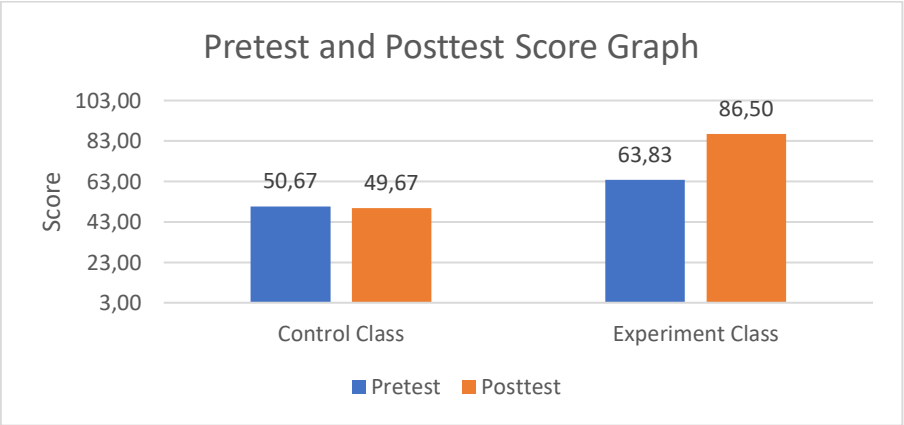

Figure 1. Student Learning Outcomes in Pretest and Posttest

Based on the data analysis and management results, the use of Android-based learning media has proven effective in improving learning outcomes and understanding of the Pancasila Student Profile material. This effectiveness is demonstrated by higher learning outcomes compared to the conventional teaching methods previously applied by teachers at the school. Testing in the experimental and control classes showed a positive impact from the use of Android-based learning media.

3.4 Developed Product

The learning media is an Android-based digital application designed to enhance education centered on the Pancasila Student Profile in elementary schools. Developed to align with the Merdeka Curriculum initiative introduced by the Indonesian government, this application aims to seamlessly integrate Pancasila values into students' daily lives. Within this framework, character education is positioned as a structured effort to guide students in understanding, internalizing, and practicing these

values in various contexts, both within and beyond the classroom (Lickona, 2016; Pike, Hart, Paul, Lickona, & Clarke, 2021).

This application was developed using Android Studio software, which also incorporates a MySQL database to integrate various types of media and produce the output in the form of an application (.apk). For image and video processing, Canva and Pixton were used for creating image illustrations, while CapCut Pro and Filmora were utilized for video production. The activities of this application are presented in Figure 2 below.

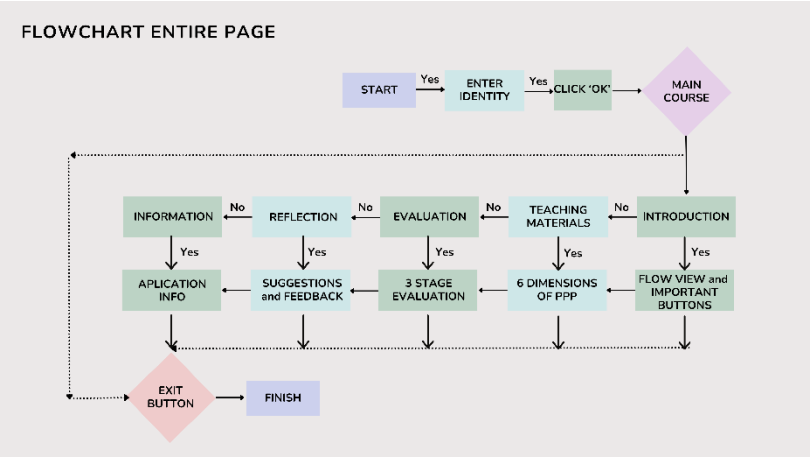

Figure 2. Application Flowchart

This application adopts an interactive learning model that places students at the center of activities. It leverages Android technology to present the six key character dimensions promoted by the Ministry of Education and Culture of the Republic of Indonesia: faith, global diversity, collaboration, independence, critical thinking, and creativity. These dimensions are integrated into several key features of the application, such as text materials, educational videos, comic strips, evaluations, and reflections. Each feature is designed to provide an interactive and immersive learning experience, allowing students to actively participate in various activities that reinforce their character development, as illustrated in Figure 2.

Figure 3. Application Interface

This application is designed with various key features, each playing an essential role in supporting learning that incorporates the Pancasila Student Profile. The text materials provide in-depth explanations of each dimension and element, enabling students to study the foundational concepts independently. The Learning Videos offer engaging visualizations to enhance students' understanding of the taught material, reinforcing knowledge through audio-visual media. Comic Strips are used to convey character values through interactive stories relevant to students' daily lives, making learning more engaging and easier to understand. The Evaluation feature is designed to measure how well students have understood and applied the values taught, offering various types of questions and evaluative activities. Finally, the Reflection feature gives students the opportunity to reflect on their learning experiences, helping them recognize their own character development as well as areas that need improvement.

3.5 Distribution

The final stage of this research is the distribution phase, aimed at disseminating the product to potential users through publication and promotion, which consists of two steps: packaging and distribution. In the packaging step, the researchers compiled the learning materials into Digital Versatile Disks (DVDs) and Flash Drives (FDs) for limited distribution to the schools where the research was conducted and surrounding areas. In the distribution step, the researchers created a publicly accessible Google Drive link and shared it personally. To minimize the risk of malware distribution, the researchers also uploaded the product legally to the Play Store, making it easy for users to download and utilize.

Discussion

This research focuses on the development and evaluation of Android-based learning media that incorporates the Pancasila Student Profile within the implementation of the Merdeka Curriculum in elementary schools. The learning media is considered very feasible to use based on the assessment of media experts and material experts, who gave an average score of 4.7 and 4.47, respectively. In addition, student feedback also supports the feasibility of this media, with an average score of 4.55, indicating that students find the media interesting and effective. This finding is in line with various previous concepts and studies, which state that well-designed digital media can increase student engagement and learning effectiveness (Radianti, Majchrzak, Fromm, & Wohlgenannt, 2020; Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2021). One of the main factors contributing to the effectiveness of this media is its interactive design. Android-based learning media offers a more dynamic learning experience through interactive elements such as quizzes, games, and simulations that actively engage students in the learning process. This supports the theory of constructivism which states that active and participatory learning is more effective in building student understanding. In addition, the visual, audio, and interactive elements contained in digital media can create a more interesting and adaptive learning experience (Lin et al., 2017).

In addition, the visual and audio elements contained in this media also contribute significantly to its effectiveness. The use of attractive visuals and audio that supports learning content can increase students' interest and attention. Research by Lin et al. (2017) shows that these elements can strengthen conceptual understanding, especially in the context of abstract material. Visual elements help students to imagine and understand information more easily, while audio can enrich the learning experience by providing clearer and more in-depth explanations. Ease of navigation in this media is also a key factor in determining its success. Simple and intuitive navigation allows students to focus on learning without being distracted by confusion in using the media. This is important in the context of the Independent Curriculum which emphasizes student learning independence. With easy-to-use media, students can easily access the materials they need without technical barriers.

The results of data analysis show that the use of android-based learning media provides a significant contribution to improving student learning outcomes. The high N-gain value in the

experimental class (0.73) compared to the control class (0.28) indicates that this digital learning media is effective in improving student understanding and stimulating critical thinking (Hussein, Ow, Cheong, & Thong, 2019; Verawati, Agustito, Pusporini, Utami, & Widodo, 2022). These findings suggest that the use of technology and interactive activities can improve student engagement and learning outcomes. This study further strengthens the argument that digital learning media not only helps students to understand concepts more deeply but also stimulates critical thinking and problem-solving skills. In addition, this media supports the integration of the Pancasila Student Profile in the Merdeka Curriculum, which is relevant to the theory of character education that emphasizes the importance of character formation through education (Hafizi, 2023; Metcalfe et al., 2023). The results of the study also showed that the integration of Pancasila values into the curriculum can form a generation with character and integrity. Thus, this Android-based media is not only effective in learning but also makes a significant contribution to achieving the goals of character education carried out by the Merdeka Curriculum (Amelia et al., 2023).

4. CONCLUSION

This study shows that the development of Android-based learning media that integrates the Pancasila Student Profile is effective in improving student learning outcomes and supporting the implementation of the Independent Curriculum in elementary schools. This media has proven to be successful in creating a more interactive, interesting, and relevant learning experience that is in line with the goals of character education in Indonesia. This study has several limitations that need to be considered. First, the scale of the study was limited to only one elementary school in an urban area. This limits the generalizability of the findings to a broader context, such as rural areas or schools with lower access to technology. Second, the evaluation only covers short-term impacts on student learning outcomes. Long-term impacts, such as behavioral changes and internalization of Pancasila values, require further research with a longitudinal design. Third, limitations in the features of the learning media. Current media do not fully accommodate the needs of students with special needs. Further development is needed to increase inclusivity.

For more effective use, teachers can utilize this media by integrating learning videos and interactive comics to introduce Pancasila values in an interesting and easy-to-understand way. The automatic evaluation feature can also be optimized to provide direct feedback to students, improve their understanding and motivate them to learn better. This research makes a significant contribution to the development of technology-based learning media that supports the Independent Curriculum. The use of Android-based applications not only increases the effectiveness of learning but also strengthens the integration of Pancasila values in basic education. This media has great potential to be a model for the development of similar media in the future, helping teachers to implement the Independent Curriculum more effectively, while increasing student access and engagement in the learning process. These findings encourage further development of technology-based learning media to support more inclusive and sustainable education in Indonesia.

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