Development of Edugames on Pancasila Material to Improve Learning Outcomes of Grade IV Students in Elementary Schools

Pengembangan Edugames pada Materi Pancasila untuk Meningkatkan Hasil Belajar Siswa Kelas IV Sekolah Dasar

Irfan Dahnial
Universitas Muhammadiyah Sumatera Utara, Indonesia
e-mail: irfandahnial@umsu.ac.id

Abstract
This research and development project utilizes the 4-D model, comprising four stages: definition, design, development, and dissemination. The research was conducted at MIN 6 Langkat from September to November during the 2024/2025 academic year. The participants included 20 fourth-grade students, 11 of whom were female and nine were male. The edugame focused on Pancasila material, which was the subject of this study. Data collection involved observation, interviews, questionnaires, and testing. The gathered data were analyzed using two methods: (1) an analysis of the edugame's feasibility and (2) an analysis of its effectiveness. The validation from language experts yielded a score of 88.65%, which falls under the feasible category. In comparison, material experts rated it at 90.10%, classifying it as very feasible, and media experts provided a score of 96.75%, marking it as very feasible. The students' pretest average in the trial was 35.07%, and the post-test score increased to 64.93%. Based on the validation and trial results, it can be concluded that the edugame on Pancasila content for grade IV students at MIN 6 Langkat is both feasible and effective.
Keywords: edugames; Pancasila; learning outcomes

Abstrak
Penelitian ini termasuk dalam kategori penelitian dan pengembangan dengan menggunakan model 4-D yang meliputi empat tahap, yaitu: pendefinisian, perancangan, pengembangan, dan diseminasi. Penelitian ini dilaksanakan di MIN 6 Langkat pada periode September hingga November tahun ajaran 2024/2025. Subjek penelitian terdiri dari 20 siswa kelas IV, yang terdiri dari 11 siswa perempuan dan 9 siswa laki-laki. Edugame menjadi objek yang diteliti dalam studi ini. Untuk pengumpulan data, digunakan metode observasi, wawancara, angket, dan tes. Data yang dikumpulkan kemudian dianalisis dengan dua pendekatan: (1) analisis kelayakan edugame, dan (2) analisis efektivitas edugame. Hasil validasi yang dilakukan oleh ahli bahasa memperoleh persentase 88,65%, yang masuk dalam kategori layak, sementara hasil validasi oleh ahli materi mencatatkan persentase 90,10%, yang dikategorikan sangat layak, dan validasi oleh ahli media mencapai 96,75%, yang juga termasuk dalam kategori sangat layak. Uji coba menunjukkan bahwa nilai pretest siswa adalah 35,07%, sedangkan posttest menunjukkan peningkatan menjadi 64,93%. Berdasarkan hasil validasi dan uji coba tersebut, dapat disimpulkan bahwa edugame pada materi Pancasila untuk siswa kelas IV di MIN 6 Langkat terbukti layak dan efektif untuk digunakan.
Kata kunci: edugame; pancasila; hasil belajar

Introduction

Education in Indonesia aims to produce a young generation who are not only academically intelligent but also have good character and understanding of national values and personality reflected in Pancasila. "Pancasila, which is the basis of the state and the outlook on life for the Indonesian people, has a very important role in the formation of character and moral values of students (Madina et al., 2024). Therefore, Pancasila education needs to be provided comprehensively and effectively from an early age, especially at the elementary education level (Zakiya & Santoso, 2024).

However, in reality, there are still many challenges in learning Pancasila in elementary schools. One of the main challenges is the teaching method which tends to be monotonous and less interesting for students, resulting in low understanding and interest in the material (Paramita & Putri, 2023). This is reflected in student learning outcomes which are still inadequate, especially in materials related to Pancasila. Conventional learning is often less able to arouse students' interest, so they are less motivated to understand and live the values contained in Pancasila (Suryanto et al., 2024).

Through observations and interviews conducted with grade IV teachers at Min 6 Langkat, it was discovered that students did not understand the Pancasila material taught by the teacher; the teacher did not use interesting learning media, so student learning outcomes were low.

To overcome the above problems, innovation is needed in teaching methods that attract students' interest and make them more active in learning. One approach that can be used is to develop edugames or educational games. Edugameis a cross between games and learning. Games that are designed for learning can still offer to play and to have fun (Hadrian, 2019). Edugames are designed so that the learning process is entertaining and exciting and can be played anytime and anywhere (Rahayu et al., 2021). This game has the potential to make learning more fun, interactive, and effective in delivering material.

According to Tasci (2016), the advantages of games are (a) increasing student engagement, (b) accommodating various learning styles, (c) improving cognitive and problem-solving abilities, (d) flexibility and accessibility, and (e) increasing collaboration. Meanwhile, the disadvantages of games are (a) limited appropriate

content, (b) dependence on technology, (c) risk of distraction, (d) lack of direct social interaction, and (e) inefficient learning time.

The application of edugames in learning Pancasila material in grade IV of Elementary School can be the right solution to improve student learning outcomes. Through games, students can learn about Pancasila values directly and practically in a fun and non-boring situation. Edugames can accommodate various learning styles of students, both visual, auditory, and kinesthetic so that learning becomes more inclusive and interesting (Weymouth & Atuah, 2022).

However, the development of edugames that are in accordance with the characteristics of Pancasila material and the educational context in Indonesia requires in-depth study. Effective edugames must be able to combine entertainment elements with clear educational objectives, and be in accordance with the applicable curriculum (Cheung & Ng, 2021). Therefore, this study aims to develop an edugame that can be used in learning Pancasila material in grade IV of Elementary School, as well as to examine the extent to which this edugame can improve student learning outcomes.

Thus, this research is expected to contribute to the development of more creative and efficient learning methods, especially in improving the understanding and application of Pancasila values among elementary school students. In addition, the results of this study are expected to be a reference for the development of other games in the context of education in Indonesia.

Method

This research is included in the category of research and development using the 4-D model introduced by Thiagarajan et al. (Panjaitan & Rasyid, 2023). The model includes four stages, namely definition, design, development, and dissemination. This research was conducted at MIN 6 Langkat in the period from September to November of the 2024/2025 academic year. The research subjects consisted of 20 fourth grade students, consisting of 11 female students and 9 male students. Edugame is the object of research in this study. Data collection techniques used include observation, interviews, questionnaires, and tests. The data collected were analyzed through two approaches, namely: (1) analysis of the feasibility of edugame, and (2) analysis of the effectiveness of edugame.

Table 1 Likert Scale Criteria (Rambe et al., 2023)

No	Answer	Score
1	Very Worth It	4
2	Worthy	3
3	Quite Decent	2
4	Not feasible	1

The formula applied to calculate the percentage of edugame validation results is as follows (Lubis et al, 2023):

$$NP = \frac{R}{SM} X\ 100\%$$

Information:

NP   = Desired percentage value
R   = Intermediate score obtained
SM   = Maximum score
100%   = Fixed number

The formula for calculating student learning outcomes is as follows (Parinduri et al., 2022):

$$P = \frac{f}{N} x\ 100\%$$

Information :

P :Percentage
f   :Frequency
N :Total Activity Count

Results and Discussion

Result

This study aims to develop an edugame that can enhance the academic performance of fourth grade elementary students. on Pancasila material. The development model applied is the 4D model, comprising four stages: definition, design, development, and dissemination.

Definition Stage

At this stage, a needs analysis was conducted to identify problems that emerged in Pancasila learning in grade IV of elementary school. Based on the results of observations and interviews with teachers, it was found that

1. Students have difficulty in understanding the values contained in Pancasila.

2. Learning tends to be theory-based without any direct interaction that is interesting for students.

3. There is a need for innovative and interesting learning media so that students are more active and interested in learning.

Based on the results of this analysis, it then became the basis for researchers to design edugames that can help students understand Pancasila in a fun way.

Design Stage

In the design stage, the researcher will design the concept of edugame that will be used for fourth grade students. This edugame is designed with the following features:

1. Theme and Story: This edu game carries an adventure theme related to the symbols and values of Pancasila. Each level in the game represents one of the principles of Pancasila that must be completed by the player (student).

2. Learning Content: Each level has challenges that require students to answer questions related to the Pancasila principles, such as "What is the meaning of the first principle?", "Give an example of the application of the second principle in everyday life", and so on.

3. Interaction and Feedback: Every interaction in the game provides immediate feedback, both positive (correct answers) and constructive (wrong answers), to help students learn independently.

4. Graphics and Animation: Attractive graphic and animation displays, adapted to the age of fourth-grade elementary school students, to increase attraction and motivation in playing.

Development Stage

After the design stage is complete, the next step is the development stage, which aims to realize the edugame. Before being tested on students, the edugame will first be validated by experts in the fields of material, language, and media. After the validation process is complete, the edugame will be tested on grade IV elementary school students. The results of the validation of the evaluations by material, language, and media experts are presented in table 2.

Table 2 Expert Validation Results

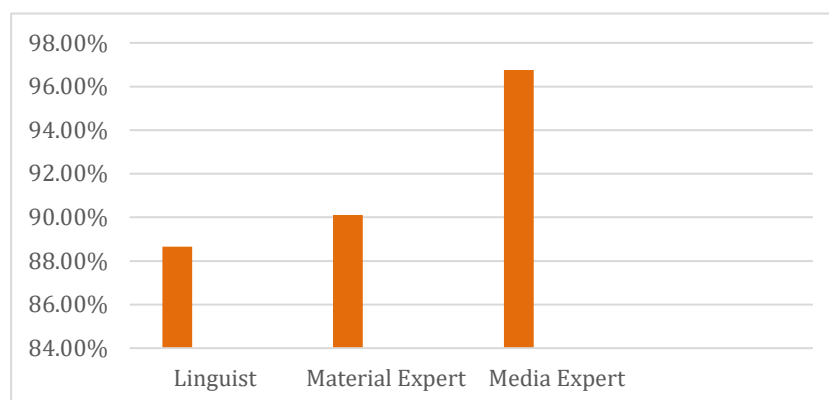| No	Validasi	Persentase	Kriteria
1	Ahli Bahasa	88.65%	Layak
2	Ahli Materi	90.10%	Sangat Layak
3	Ahli Media	96.75%	Sangat Layak

Figure 1 Expert Validation Results

The information shown in table 2 and figure 1 reveals that the validation from language experts achieved a score of 88.65%, which falls into the feasible category. In contrast, the validation from material experts achieved 90.10%, which is categorized as very feasible, while the validation from media experts scored 96.75%, also falling into the very feasible category. Considering the validation results from all three experts, the developed edugame is deemed suitable for use.

After completing the validation of egume and declared suitable for use by fourth grade students, the edugame will then be tested in the field. This trial was conducted to assess the extent to which the edugame can be accepted by students and to identify potential improvements before being widely used. The trial was conducted at Min 6 Langkat. During the trial, students were given the opportunity to use the edugame in the Pancasila learning process, while the teacher would observe and record the reactions and developments of students during the learning process. The data collected from this trial will be analyzed to measure the effectiveness of the edugame in improving the understanding and learning outcomes of fourth grade students, as well as to identify challenges or obstacles that may be faced during implementation in the classroom. A comparison the learning outcomes of students who used the edugame in both the pretest and posttest are presented in the table below.

Table 3 Recapitulation of Students' Pretest and Posttest Scores

No	Nama Siswa	Nilai Pretest	Kriteria Pretest	Nilai Posttest	Kriteria Posttest
1	01	50	Tidak Tuntas	90	Tuntas
2	02	60	Tidak Tuntas	80	Tuntas
3	03	30	Tidak Tuntas	80	Tuntas
4	04	40	Tidak Tuntas	90	Tuntas
5	05	70	Tidak Tuntas	80	Tuntas
6	06	40	Tidak Tuntas	80	Tuntas
7	07	30	Tidak Tuntas	90	Tuntas
8	08	40	Tidak Tuntas	80	Tuntas
9	09	60	Tidak Tuntas	100	Tuntas
10	10	50	Tidak Tuntas	80	Tuntas
11	11	30	Tidak Tuntas	100	Tuntas
12	12	50	Tidak Tuntas	80	Tuntas
13	13	60	Tidak Tuntas	90	Tuntas
14	14	40	Tidak Tuntas	90	Tuntas
15	15	50	Tidak Tuntas	90	Tuntas
16	16	80	Tuntas	100	Tuntas
17	17	40	Tidak Tuntas	90	Tuntas
18	18	20	Tidak Tuntas	80	Tuntas
19	19	40	Tidak Tuntas	80	Tuntas
20	20	60	Tidak Tuntas	90	Tuntas
	Jumlah	940		1740	
	Rata-rata	1340			
	Persentase	35,07%		64,93%	
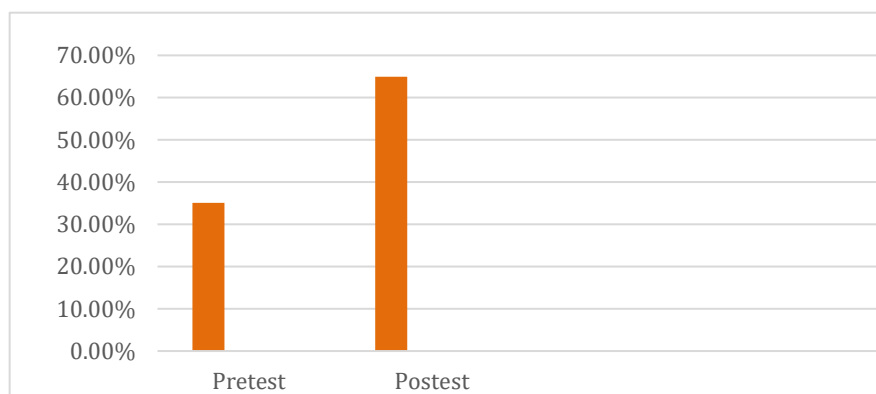
Figure 2 Recapitulation of Pretest and Posttest Results of Grade IV Students

Looking at the results listed in Table 3 and Figure 2 above, based on the findings, it can be stated that there was an improvement in student learning outcomes between the pretest and posttest using games on Pancasila material for fourth-grade students at Min 6 Langkat. The student learning outcomes during the pretest were 35.07% and the student learning outcomes during the posttest were 64.93%. Based on the percentage results, it can be said that games on Pancasila material are said to be effective for fourth-grade students at Min 6 Langkat.

Based on the results of the trial conducted at Min 6 Langkat, testing the use of edugames on Pancasila material showed significant findings. The developed edugame successfully demonstrated its effectiveness as an interesting and interactive learning media for grade IV students. The trial results showed that: (a) Edugames can be run smoothly on computers and tablets used by students. This shows that the technology used in developing edugames is in accordance with the devices available in elementary schools, thus facilitating implementation without significant technical constraints, (b) Students showed high enthusiasm in playing and learning through this game. The high level of enthusiasm can be seen from the active participation of students in each learning session. The fun and challenge-based interactions in the game encourage students to be more enthusiastic in learning Pancasila material, which is often considered difficult if delivered using conventional methods, and (c) Most students can understand the values of Pancasila more easily and enjoyably through interactions in the game. This edugame not only makes learning more interesting, but also makes it easier for students to remember and understand the meaning and application of the values contained in Pancasila. This experience-based learning is in accordance with the principles of constructivism, where students learn in an active and meaningful way.

Dissemination Stage

At the dissemination stage, the edugame that has been developed is then introduced and promoted to other elementary schools. In addition, teachers are given training on how to integrate the use of edugames in Pancasila learning in the classroom. From the observations and interviews conducted with teachers and students following the dissemination, it was discovered that (a) this edu game was well received by teachers and students, because it provided a different learning experience from conventional learning methods, and (b) student learning outcomes on Pancasila material experienced a significant increase compared to before the use of edugames.

With this success, it is hoped that the use of technology in education will be further expanded, so that it can create a more interactive, enjoyable, and meaningful learning experience. For further development, it is necessary to improve features and provide training for teachers to maximize the use of edugames in the learning process in the classroom. As a further step, it is hoped that this edugame can be implemented more widely in other elementary schools, in order to have a positive impact on the quality of education in Indonesia.

Discussion

Character education is one of the main objectives in learning Pancasila in elementary schools. However, the main challenge faced is how to convey the abstract and complex values of Pancasila in an interesting and easy-to-understand way for students (Mukaromah et al., 2022). One solution that can be applied is the development of Edugame on Pancasila material. Education combines elements of entertainment and learning, making it an effective tool to increase students' enthusiasm and involvement throughout the learning process., according to the motivation theory by Ryan & Deci (2000), students are more engaged when they experience an enjoyable learning environment., their intrinsic motivation to learn will increase.

Edugame on Pancasila material can support a range of student learning preferences, including visual, auditory, and kinesthetic. This is in accordance with the learning theory put forward by Weymouth & Atuah (2022) which explains that Education provides opportunities for students to learn in a way that suits their preferences. Students who prefer to learn with pictures or visuals can benefit from the graphic elements in the game, while those who prefer to hear verbal explanations can enjoy the narrative in the game. This flexible approach helps make learning more inclusive and personal for students with different learning styles (Landrum & McDuffie, 2010).

In addition to increasing engagement, Edugame also allows students to internalize Pancasila values through more applicable simulations or scenarios (Umisara, et al., 2023). For example, games can challenge students to solve problems related to everyday life, such as how to maintain unity in diversity or how to solve problems through deliberation. Edugame allows students to interact with content related to Pancasila and gain a deeper understanding of these concepts (Rahayu et al., 2024).

However, in developing Edugame, there are challenges related to game design that must create a balance between entertainment and learning. Games that focus too much on the entertainment aspect can distract students from learning objectives (Chen et al., 2020). Therefore, collaboration between game developers and teachers is needed so that game design remains in accordance with the curriculum and can support the achievement of learning objectives. In addition, researchers must ensure that game elements, such as challenges and rewards, can increase student motivation without reducing the substance of the material presented.

In the context of implementation in elementary schools, another challenge that needs to be considered is the limited access to technology. Not all schools, especially in remote areas, have adequate technology facilities to support the optimal use of Edugame. This can create gaps in the implementation of educational games in various schools. Therefore, efforts need to be made to overcome this problem, either by providing more evenly distributed devices or by designing games that can be accessed on various platforms with low specifications.

Conclusion

According to the validation results from experts, the edugame was deemed suitable, receiving an 88.65% rating from language experts, 90.10% from material experts, both falling under the 'very feasible' category, and 96.75% from media experts, which also qualified it as 'very feasible.' Based on the evaluations from all three expert groups, the edugame was considered appropriate for use. The trial results indicated an improvement in student learning outcomes after using the edugame in their studies. Pancasila material in class IV MIN 6 Langkat. Student scores in the pretest were recorded at 35.07%, while in the posttest increased to 64.93%. Seeing the difference in percentages, it can be concluded that edugames on Pancasila material have proven effective for class IV students at MIN 6 Langkat. Considering the validation and trial results, it can be concluded that the implementation of edugames on Pancasila content for class IV students at MIN 6 Langkat has proven feasible and effective to be implemented.

Reference

Chen, MB, Wang, SG, Chen, YN, Chen, XF, & Lin, YZ (2020). A preliminary study of the influence of game types on the learning interests of primary school students in digital games.*Education Sciences*,*10*(4), 96.

Cheung, S.Y., & Ng, KY (2021, March). Application of the educational game to enhance student learning. In*Frontiers in Education*(Vol. 6, p. 623793). Frontiers Media SA.

Hardian, R. (2019). Development of mobile mathematics edugames to improve basic arithmetic skills of elementary school students in grades 4 and 5.*Visual Language Journal*,*2*(2), 98-108.

Landrum, T. J., & McDuffie, K. A. (2010). Learning styles in the age of differentiated instruction.*Exceptionalism*,*18*(1), 6-17.

Lubis, RR, Dwiningrum, SIA, & Zubaidah, E. (2023). Development Powtoon Animation Video in Indonesian Language Learning to Improve Student Learning Outcomes Elementary Schools.*Journal of Computer Science, Information Technology and Telecommunication Engineering*,*4*(2), 427-433.

Madina, S., Suparno, NO, Marni, A., & Aulia, GA (2024). IMPLEMENTATION OF PANCASILA EDUCATION TO REALIZE THE NATION'S IDEALS AND GOALS.*Journal of Social Education and Humanities*,*3*(4), 5160-5167.

Mukaromah, SA, Gusmawan, A., & Munandar, J. (2022). The Lunge of Global Ideologies: The Challenges of Pancasila Ideology Education in the Middle of Global Existence in the Era of Globalization.*Panjar Journal: Community Service in the Field of Learning*,*4*(1), 1-30.

Panjaitan, NAS, & Al Rasyid, H. (2023). Development of Arabic Comic Learning Media Based on Canva.*Journal of Education Research*,*4*(2), 484-495.

Parinduri, WM, Lubis, RR, Rambe, TR, & Rambe, N. (2022). Development of Flipbook Based Smart Card Learning Media in Science Learning to Improve Student Learning Motivation Class III Elementary School.*School Education Journal PGSD FIP Unimed*,*12*(3).

Pramita, C., & Putri, TR (2023). The Effect of Learning Interest on Students' Concept Understanding Ability Against Subject Pressure.*International Journal of Education and Teaching Zone*,*2*(2), 243-253.

Rahayu, Y., Ahmad, HA, & Alamsyah, IM (2021). The implementation of tpack framework in mathematics mobile edugame design: Basic multiplication and division concept. Journal of Physics: Conference Series, 1722(1).https://doi.org/10.1088/1742-6596/1722/1/012029

Rahayu, WI, Leksono, SM, & Nulhakim, L. (2024). Mobile Learning Based Learning Using Etno Edu Games to Improve Students' Critical Thinking and Cognitive Abilities on IPAS Subjects in Grade IV Elementary School.*Journal of Science Education Research*,*10*(9), 6504-6515.

Rambe, N., Parinduri, WM, & Lubis, RR (2023). Character Education-Based Modules in Indonesian Language Learning to Improve Student Learning Outcomes in Elementary Schools.*Pedagogical Journal of Islamic Elementary School*,*6*(2), 135-146.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions.*Contemporary educational psychology*,*25*(1), 54-67.

Suryanto, H., Ghofur, A., & Zaman, AQ (2024). The Effect of the Teams Games Tournament (TGT) Model and Motivation on Understanding Pancasila Philosophy.*Edunesia: Scientific Journal of Education*,*5*(1), 402-423.

Taşçı, B.G. (2016). Theoretical framework for using digital games in architecture education.*Architecture Research*,*6*(3), 51-56.

Umisara, E., Mutaqin, A., & Hidayah, SUN (2023). Development of Educational Augmented Reality Game as English Language Learning Media with Character Education Values.*Vehicle*,*75*(2), 73-86.

Weymouth, J., & Atuah, R. (2022, December). Review of Video Games & Simulation in Computer Science Education. In*2022 International Conference on Computational Science and Computational Intelligence (CSCI)*(pp. 2091-2096). IEEE.

Zakiya, A., & Santoso, G. (2024). Habituation of the Mutual Cooperation Character in Pancasila Education in Elementary Schools.*IJEBD (International Journal of Entrepreneurship and Business Development)*,*7*(4), 785-793.