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Educaplay-based froggy jump learning media to improve digital literacy in learning the pancasila principles

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Abstract

Observations at SDN Kaligambir 02 revealed that the use of monotonous and limited learning media contributed to students' low understanding of Pancasila learning material. In addition, the inappropriate use of mobile phones indicated that the digital literacy of fourth-grade students remained relatively low. This study developed an Educaplay-based Froggy Jump learning medium for the topic of the Pancasila principles to improve students' digital literacy. The study employed a research and development (R&D) approach using the ASSURE model. A trial involving 16 students was conducted using a one-group pretest-posttest design. The results showed that the mean pretest score of 38.75 increased to a mean posttest score of 80.00, with an N-Gain score of 0.709, which falls into the high category. The Shapiro-Wilk normality test showed significance values above 0.05, the Levene homogeneity test produced a significance value of 0.122, and the paired-samples t-test showed a significance value of 0.000 (< 0.05). These results indicate a statistically significant improvement after the implementation of the media. The developed learning medium offers an alternative solution for overcoming student boredom in conventional learning while improving students' digital competence. Therefore, the Educaplay-based Froggy Jump media was declared valid, feasible, and innovative for Pancasila Education in the digital era.

Kata kunci
media pembelajaran; *froggy jump*; *educaaplay*; makna sila pancasila; literasi digital.

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Abstrak

Hasil observasi di SDN Kaligambir 02 menunjukkan keterbatasan media pembelajaran yang monoton, menyebabkan rendahnya pemahaman materi Pancasila, selain itu penggunaan handphone yang kurang tepat menyebabkan literasi digital siswa kelas IV tergolong rendah. Peneliti mengembangkan media pembelajaran "*Froggy Jump*" berbasis *Educaplay* materi Sila Pancasila untuk meningkatkan literasi digital. Dengan menggunakan pendekatan Research and Development (R&D) serta menggunakan model ASSURE. Uji coba pada 16 siswa dengan desain One-Group Pretest-Posttest menunjukkan rata-rata pretest 38,75 naik menjadi posttest 80, N-Gain 0,709 (kategori tinggi). Uji normalitas (Shapiro-Wilk Sig. >0,05), homogenitas (Levene Sig. 0,122), dan paired t-test (Sig. 0,000 <0,05) membuktikan peningkatan signifikan. Media pembelajaran ini menjadi solusi untuk mengatasi kejenuhan pembelajaran konvensional, meningkatkan dan kemampuan digital siswa. Media dinyatakan valid, layak, dan sebagai solusi inovatif Pendidikan Pancasila di era digital.

INTRODUCTION

Pancasila Education has a strategic function in the Indonesian curriculum system, particularly at the elementary school level. This subject not only aims to introduce the fundamental values of the state but also seeks to cultivate students' personality, character, and moral conduct. Amalia et al. (2024) state that education is a fundamental and structured process for creating learning conditions and learning activities that enable students to optimize their potential. In elementary schools, Pancasila Education serves as a foundation for guiding students to become morally upright and responsible individuals. In line with this view, Fatih et al. (2024) explain that Pancasila, as the foundation of the Indonesian state, should not merely be studied conceptually but should also be understood as a set of values that students must be able to implement in everyday life. Therefore, Pancasila Education in elementary schools is important because it teaches the basic values of the state and shapes students' character and morals as a foundation for developing a responsible younger generation with positive attitudes toward the nation and the state.

The implementation of Pancasila Education in elementary schools must be carried out effectively so that students are able to understand and apply the values contained in Pancasila. According to Amalia et al. (2025), Pancasila values play an essential role for all Indonesian citizens, particularly children and the millennial younger generation. An engaging and relevant learning process can facilitate students' internalization of the values of each Pancasila principle. Gawise et al. (2022) argue that innovative teaching media can improve student learning by strengthening their understanding of the material being taught. These statements indicate the need for varied approaches in teaching Pancasila Education. Thus, the implementation of Pancasila Education in elementary schools needs to be effective so that students can more readily comprehend learning content. Mawarni et al. (2024) further emphasize that the use of attractive and interactive media can improve students' understanding of learning material. Teachers are therefore encouraged to use various approaches so that learning becomes more diverse and can increase students' interest and comprehension.

Based on information obtained from classroom observations and interviews with the fourth-grade homeroom teacher and students on 13-14 October 2025 at SDN Kaligambir 02, the researcher found that learning media had been used by the teacher, but the variety of media implemented remained limited and tended to be monotonous. This finding is consistent with Amalia et al. (2025), who state that the limited use of media causes students to feel bored and less motivated. Interviews with fourth-grade students also showed that they perceived Pancasila Education as boring and unattractive, which reduced their understanding of the learning content. The lack of varied media affected students' participation in learning activities, and consequently their understanding of the material was not fully achieved. According to Nurhaswinda et al. (2025), interactive media not only improves students' understanding but also makes the learning process more engaging. Therefore, creative and innovative media are needed to improve students' understanding of and interest in the learning material.

In the modern era, teachers are also required to implement educational digitalization. Fatih et al. (2020) note that teachers should utilize technology-based devices to create innovative learning media that support teaching and learning processes. In the digital era, many aspects of life are connected to digital media, and society is indirectly required to adapt to ongoing developments in digital media. According to Fatih et al. (2024), the digital era is a period in which people use technology to meet most of their daily needs. In reality, however, many students at SDN Kaligambir 02 have not yet been able to use digital media appropriately. Although students have devices that can access digital media, they have not been adequately trained to operate learning media through digital platforms, process digital information, or produce meaningful digital responses. Without sufficient digital literacy preparation, the use of digital media in learning may become a burden or a source of confusion. This condition indicates low readiness in digital literacy. Alfi et al. (2023) explain that

individuals' ability to understand digital content enables them to generate new knowledge from such understanding and skills.

To address this urgency, an innovation in learning media that is more attractive and less monotonous is needed. Azmia et al. (2025) state that innovative media are tools for delivering information, learning material, and knowledge that can motivate students, accelerate understanding, and increase students' interest compared with conventional media such as textbooks, which often cause boredom. The Educaplay-based Froggy Jump media offer an engaging new way to deliver Pancasila Education material to students. Interactive media can increase student participation and help them understand learning material through enjoyable activities. By using educational games, students can learn while playing, thereby increasing their motivation to learn. The development of interactive learning media such as Educaplay-based Froggy Jump is therefore important as a solution for Pancasila education learning because it encourages students' involvement, supports their understanding, and increases learning motivation through a learn-through-play approach.

Through Educaplay-based Froggy Jump media, students are expected not only to understand the values of the Pancasila principles but also to apply them in their everyday lives. Through this innovative and interactive approach, students are expected to grow into a generation that understands and values Pancasila more deeply. The development of this media is also intended to improve students' digital literacy so that they are better prepared to face changes accompanying the development of digital media. In line with Siwi et al. (2025), interactive teaching media can increase students' motivation to learn. Accordingly, Pancasila Education learning in elementary schools is expected to become more effective and engaging. The development of learning media using Educaplay helps teachers design a dynamic learning process that is aligned with the curriculum while increasing student motivation.

The topic "The Meaning of Pancasila Principles in Society" is the main focus in the development of this learning medium. The importance of understanding the meaning of Pancasila in society has also been emphasized. Saputri and Amalia (2026) state that Pancasila Education plays a crucial role in shaping students' character through the integration of Pancasila values into learning activities that develop spiritual capacity, self-control, positive personality, moral conduct, and social skills. Through this learning, students are expected to appreciate differences, uphold unity, and contribute positively to society. This material helps students understand the values contained in each principle so that they can implement them in real community life. The topic of the meaning of Pancasila in society highlights the importance of understanding and applying the values of each principle. A deeper understanding of these values helps students develop good character and understand the application of Pancasila values in social interaction and community life.

Referring to the urgency of the problem, namely students' limited understanding of the meaning of Pancasila principles in society and their low level of digital literacy, the researcher was interested in developing an attractive and interactive medium with a specific format that had not previously been examined. The researcher developed Educaplay-based Froggy Jump learning media by providing various question challenges in the form of text and images that are attractive and relevant to the topic of the meaning of Pancasila principles in society, allowing students to learn in an enjoyable way. Therefore, this study is entitled "Development of Educaplay-Based Froggy Jump Learning Media on the Meaning of Pancasila to Improve Digital Literacy."

RESEARCH METHOD

Type of Research

A research approach is a paradigm or conceptual framework that serves as the basis for researchers in collecting, analyzing, and interpreting data. Seels and Richey (1994) define research and development as a systematic study that examines the design, development, and evaluation of instructional programs, procedures, and products that must meet standards of validity, practicality,

and usefulness. In developing Froggy Jump learning media, this study employed the Research and Development (R&D) method, which aims to produce a learning product and test its validity and feasibility using empirical data. The R&D approach does not merely focus on descriptive data collection; rather, it involves a cycle of planning, product development, trial, and evaluation to ensure that the resulting product is of good quality and feasible for use.

Research Procedure

This study used the ASSURE development model developed by Sharon E. Smaldino and colleagues. The model consists of six stages: Analyze Learners, State Objectives, Select Methods, Media, and Materials, Utilize Media and Materials, Require Learner Participation, and Evaluate and Revise. These stages were applied in designing the Educaplay-based Froggy Jump learning media for the topic of the meaning of Pancasila principles in society.

Research Subjects

The subjects of this study were fourth-grade students of SDN Kaligambir. The students were characterized as digital natives, meaning that they had been familiar with digital technologies such as mobile phones from an early age. In accordance with these characteristics, almost all fourth-grade students were able to operate mobile phones. Therefore, teachers need to innovate by creating attractive media that can be accessed through mobile phones so that these devices can be used for positive educational purposes.

Data Collection Instruments

The instruments used in this study consisted of instrument validation and feasibility assessment instruments. The feasibility assessment instruments included media expert validation sheets, material expert validation sheets, and teacher response feasibility sheets.

Data Validity Testing

Two types of instrument testing were used in this study: validity testing and reliability testing.

1. Validity Test

According to Sugiyono, as cited in Hakiki and Setiana (2023), validity refers to the degree of correspondence between the data obtained from the research object and the data presented by the researcher. Item validity was tested through item analysis by correlating each item score with the total score. The product-moment correlation formula used was as follows:

$$r_{xy} = [n\Sigma XY - (\Sigma X)(\Sigma Y)] / \sqrt{\{[n\Sigma X^2 - (\Sigma X)^2][n\Sigma Y^2 - (\Sigma Y)^2]\}}$$

where n is the sample size, X is the score for each item, Y is the total score, ΣX is the total item score, and ΣY is the total score for all items. Validity testing was conducted to ensure whether the instrument content had an adequate level of validity. According to Juliani and Erita (2023), validity testing is necessary to determine the adequacy of the measuring instrument used by the researcher.

Table 1. Instrument Validity Criteria

Range	Category
$0.80 < r \leq 1.00$	Very high
$0.60 < r \leq 0.80$	High
$0.40 < r \leq 0.60$	Moderate
$0.20 < r \leq 0.40$	Low
$-1.00 < r \leq 0.20$	Very low

Based on these criteria, an item is considered valid when the calculated correlation coefficient ($r_{calculated}$) is greater than r_{table}. Conversely, an item is considered invalid when $r_{calculated}$ is less than or equal to r_{table}.

2. Reliability Test

According to Sugiyono, as cited in Hakiki and Setiana (2023), reliability testing is conducted to determine the consistency of an instrument in obtaining stable data when used repeatedly on the same object. Reliability testing was conducted on questionnaire items that had been declared valid. The reliability coefficient was calculated using Cronbach's Alpha:

$\alpha = [k/(k - 1)] [1 - (\Sigma\sigma_i^2 / \sigma_t^2)]$

where α is the reliability coefficient, k is the number of items, $\Sigma\sigma_i^2$ is the total item variance, and σ_t^2 is the total variance. The reliability coefficient criteria are presented below.

Table 2. Reliability Criteria

Range	Category
$0.80 < r \leq 1.00$	Very high
$0.60 < r \leq 0.80$	High
$0.40 < r \leq 0.60$	Moderate
$0.20 < r \leq 0.40$	Low
$-1.00 < r \leq 0.20$	Very low

Reliability testing evaluates the dependability of measurement results (Juliani & Erita, 2023). An instrument with two response alternatives is considered reliable when r_i is greater than r_t. Meanwhile, an instrument with more than two response options is considered reliable when Cronbach's Alpha is within the range of 0.70 to 0.90 (Yusup, 2018).

Data Analysis Techniques

1. Material and Media Expert Validation

The development of Educaplay-based Froggy Jump media used validation questionnaires to determine whether the developed media was valid and effective for use or implementation. The expert questionnaire was analyzed using a Likert scale. Riduwan and Kuncoro, as cited in Purwanto (2018), state that the Likert scale is frequently used to measure attitudes, opinions, and perceptions toward an object.

Table 3. Likert Scale Assessment Categories

Code	Alternative Response	Score
SB	Very good	5
B	Good	4
CB	Fairly good	3
KB	Poor	2
SKB	Very poor	1

The validation questionnaire in the development of Educaplay-based Froggy Jump media was analyzed by comparing the total obtained score with the maximum possible score from the validator. The expert validation percentage was calculated using the following formula:

Percentage = (obtained score / maximum score) × 100%

Table 4. Material and Media Validation Criteria

Percentage	Criteria
81%-100%	Highly valid
61%-80%	Valid
41%-60%	Moderately valid
21%-40%	Invalid
0%-20%	Highly invalid

2. Product Feasibility Questionnaire

Product feasibility analysis was conducted after expert validation. The feasibility of Educaplay-based Froggy Jump media was calculated using the following formula:
Feasibility result = (obtained score / maximum score) × 100%

Table 5. Media Feasibility Criteria

Percentage	Category
81%-100%	Highly feasible
61%-80%	Feasible
41%-60%	Moderately feasible
21%-40%	Not feasible
<21%	Highly not feasible

The data obtained consisted of validator assessments of the Educaplay-based Froggy Jump media. The developed media was evaluated according to the research instruments designed to assess its contribution to improving students' digital literacy. The information collected came from the design validation stage, the development process, and the media trial implementation. Scores were obtained from questionnaires and expert assessments and were then used to determine the feasibility of implementing Educaplay-based Froggy Jump media for the topic of the meaning of Pancasila principles in society.

3. Test of Improvement in Digital Literacy

The improvement in digital literacy was analyzed using a test sheet. Students' improvement was examined based on pretest and posttest scores and then interpreted using the N-Gain formula:
N-Gain = (posttest score - pretest score) / (maximum score - pretest score)

Table 6. N-Gain Criteria

Score	Description
$-1.00 \leq g < 0.00$	Decrease
$g = 0.00$	No improvement
$0.00 < g < 0.30$	Low
$0.30 \leq g < 0.70$	Moderate
$0.70 \leq g < 1.00$	High

The improvement test for digital literacy using Educaplay-based Froggy Jump media was followed by prerequisite tests and hypothesis testing.

a. Normality Test

The normality test was conducted using the Shapiro-Wilk method in SPSS to determine whether the data were normally distributed. If the significance value (Sig.) is greater than 0.05, the data are considered normally distributed.

Table 7. Normality Test Decision Criteria

Aspect	Criterion
Observed value	Sig. (p-value) in the Tests of Normality table for Kolmogorov-Smirnov and Shapiro-Wilk
Decision threshold (α)	0.05
If Sig. > 0.05	The data are normally distributed; the normality assumption is accepted.
If Sig. ≤ 0.05	The data are not normally distributed; the normality assumption is rejected.
Implication	Normally distributed data may be analyzed using parametric tests; otherwise, transformation or nonparametric tests may be considered.

b. Homogeneity Test

The homogeneity test was conducted before the t-test to ensure whether the data had homogeneous variance. This test used the Levene method with SPSS. The data are considered homogeneous when Sig. > 0.05 and not homogeneous when Sig. < 0.05.

Table 8. Homogeneity Test Decision Criteria

Aspect	Criterion
Purpose	To determine whether the variance of the data is homogeneous or not.
Observed value	Sig. (p-value) in the homogeneity test output, such as Levene's test.
Decision threshold (α)	0.05
If Sig. < 0.05	The variances are not equal; the homogeneity assumption is rejected.
If Sig. > 0.05	The variances are equal; the homogeneity assumption is accepted.
Implication	Homogeneous data may be analyzed using parametric tests such as t-tests or ANOVA; otherwise, nonparametric tests or correction procedures may be considered.

Hypothesis Test

The t-test was used to determine changes in students' digital literacy before and after the treatment. The significance of improvement in digital literacy was analyzed after the data met the assumption of normal distribution. The paired-samples t-test formula is:

$t = \bar{D} / (SD\_D / \sqrt{n})$

where t is the calculated t-value, $\bar{D}$ is the mean difference between the first and second measurements, SD_D is the standard deviation of the differences, and n is the number of samples.

Table 9. Hypothesis Test Decision Criteria

Aspect	Criterion
Significance level (α)	Commonly α = 0.05 (5%) is used as the threshold for statistical significance.
Significance value (Sig.)	The p-value obtained from the t-test output and compared with α.
Degrees of freedom (df)	For a paired-samples t-test, df = N - 1.
Decision criterion	If Sig. ≤ α, the difference is significant and H0 is rejected.
Decision criterion	If Sig. > α, the difference is not significant and H0 is accepted.
Meaning of a significant difference	The means of the two conditions are considered statistically different in the population.
Meaning of a non-significant difference	The observed mean difference may be explained by sampling error; statistically, there is insufficient evidence of a difference.

RESULTS AND DISCUSSION

The development of varied and innovative teaching media was intended to improve students' learning participation and digital literacy, particularly in Pancasila Education on the meaning of the Pancasila principles in community life for fourth-grade students at SDN Kaligambir 02. Students had difficulty understanding the material and were less active during learning, so the expected learning outcomes had not been optimally achieved. In addition, the use of learning resources that were less innovative and not integrated with digital technology contributed to students' low digital literacy. The Froggy Jump learning media developed through the Educaplay platform was expected to serve

as an alternative solution that helps teachers present material more effectively while increasing student activity. This research and development study applied the ASSURE model as the implementation framework.

Analyze Learners

This stage focused on analyzing learner characteristics as the basis for designing learning media. Information was collected through an interview with the fourth-grade homeroom teacher of SDN Kaligambir 02, Mrs. Krisma Dewi Firdaus, S.Pd. The interview indicated that fourth-grade students had not fully mastered the predetermined learning outcomes. It also showed that almost all fourth-grade students at SDN Kaligambir 02 were able to operate mobile phones. Therefore, teachers need to innovate by creating engaging media that can be accessed through mobile phones so that these devices are used for positive learning purposes. The analysis indicated that fourth-grade students at SDN Kaligambir 02 required more diverse, attractive, and digitally supported learning resources to optimize the learning process.

State Objectives

At this stage, the researcher formulated learning objectives systematically and specifically based on the learning outcomes specified in the curriculum. For the topic of the meaning of Pancasila principles in society, the learning objectives focused on students' ability to mention the main symbols of Pancasila, explain the meaning of each principle, identify the values embodied in the principles, evaluate the role of the principles in community life, and implement the meaning of Pancasila principles in society. The intended learning outcome was that students would be able to identify the meaning of Pancasila principles in everyday life.

Select Methods, Media, and Materials

In the third stage, the researcher selected the Cooperative Integrated Reading and Composition (CIRC) method as the learning approach because it emphasizes collaboration and cooperation among group members, reading comprehension, discussion, and joint idea development. This method can encourage students' activity and understanding of the material. The selected medium was Educaplay-based Froggy Jump. This medium was designed to present the meaning of Pancasila principles in community life through enjoyable educational game activities. By combining CIRC and Educaplay-based Froggy Jump, the learning process was expected to become more varied and to help students understand and implement the material more easily.

Utilize Media and Materials

In this stage, the Educaplay-based Froggy Jump learning media and its supporting instruments were used after undergoing a series of expert validations.

1. Instrument Validation Results

Instrument validation was conducted to examine the content validity of the instruments before they were used to assess the Educaplay-based Froggy Jump media. The validation results are presented below.

Table 10. Instrument Validation Results

Validation	Percentage	Category
Media expert instrument validation	98%	Highly valid
Material expert instrument validation	96%	Highly valid
Teacher response feasibility instrument validation	100%	Highly valid

2. Product Validation Results

After completing instrument validation, the researcher conducted product validation involving media experts, material experts, and teacher responses regarding feasibility. This validation process aimed to assess the validity level of the Educaplay-based Froggy Jump learning media. Product validation was conducted by three validators with relevant expertise.

Table 11. Expert Validation Results

Validation	Percentage	Category
Media expert	98%	Highly valid
Material expert	98%	Highly valid
Teacher response on feasibility	100%	Highly valid

3. Digital Literacy Improvement Test Items

The test items used to measure improvement in digital literacy were validated through two tests: validity and reliability.

a. Validity Test

The validity test consisted of construct validity and content validity. The construct validity results are presented below.

Table 12. Construct Validity Results

Aspect	Score	Percentage
Clarity	15	100%
Content accuracy	5	100%
Relevance	10	100%
Content validity	5	100%
Language accuracy	15	100%
Total score	50	100%
Category	Highly valid	

Content validity was analyzed using the product-moment correlation technique by calculating the r-value for each test item and comparing it using SPSS. The test items were administered to 21 fifth-grade students. An item was declared valid when r_calculated > r_table. The results are presented below.

Table 13. Content Validity Results

Item Number	r_calculated	r_table	Result
1	0.468	0.433	Valid
2	0.533	0.433	Valid
3	0.534	0.433	Valid
4	0.603	0.433	Valid
5	0.485	0.433	Valid
6	0.815	0.433	Valid
7	0.743	0.433	Valid
8	0.625	0.433	Valid
9	0.751	0.433	Valid
10	0.677	0.433	Valid

The content validity analysis showed that all 10 digital literacy improvement test items were valid.

b. Reliability Test

The reliability of the test items was examined using Cronbach's Alpha with the assistance of SPSS. The result is presented below.

Table 14. Reliability Test Results

Cronbach's Alpha	Number of Items
0.820	10

The table shows that the 10 test items were reliable because the Cronbach's Alpha value was 0.820. This value falls within the range of $0.80 \leq r \leq 1.00$ and is therefore categorized as having very high reliability.

Require Learner Participation

At this stage, students were directly involved in the learning activities using the developed Educaplay-based Froggy Jump media. Before involving students, the researcher first tested the feasibility of the media through the fourth-grade teacher.

Table 15. Teacher Response Feasibility Validation

Validation	Percentage	Category
Teacher response feasibility validation	98%	Highly valid

The researcher then implemented the product with students by conducting pretest and posttest activities. The implementation involved 16 fourth-grade students of SDN Kaligambir 02, Blitar Regency, and was carried out in three meetings: the first meeting for the pretest, the second meeting for media implementation or treatment, and the third meeting for the posttest.

Table 16. N-Gain Score Results

No.	Posttest	Pretest	Posttest - Pretest	Ideal Score (100) - Pretest	N-Gain Score	N-Gain (%)
1	80	40	40	60	0.67	66.67
2	70	30	40	70	0.57	57.14
3	70	30	40	70	0.57	57.14
4	80	30	50	70	0.71	71.43
5	80	30	50	70	0.71	71.43
6	70	20	50	80	0.63	62.50
7	60	10	50	90	0.56	55.56
8	100	70	30	30	1.00	100.00
9	80	40	40	60	0.67	66.67
10	90	40	50	60	0.83	83.33
11	90	50	40	50	0.80	80.00
12	60	20	40	80	0.50	50.00
13	90	60	30	40	0.75	75.00
14	100	70	30	30	1.00	100.00
15	70	20	50	80	0.63	62.50
16	90	60	30	40	0.75	75.00
Mean	80.00	38.75	41.25	61.25	0.709	70.898

In the first meeting, the pretest administered to fourth-grade students showed an unsatisfactory mean score of 38.75. In the second meeting, the product was implemented as the treatment. In the third meeting, the posttest was conducted, and the mean score increased to 80.00. The mean ideal score was 61.25, the mean N-Gain score was 0.709, and the mean N-Gain percentage was 70.898%.

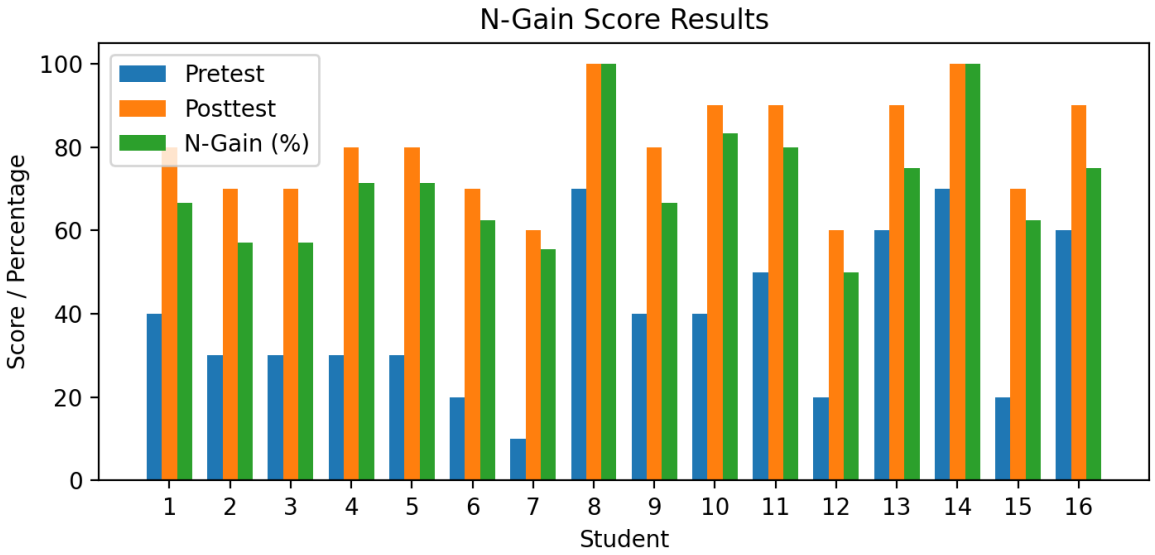

Figure 1. N-Gain Score Results

The figure illustrates an improvement in students' digital literacy after using the Educaplay-based Froggy Jump learning media. The improvement was calculated by comparing the pretest and posttest scores and analyzing the data using N-Gain. The N-Gain score of 0.709 is categorized as high because it falls within the range of $0.70 \leq g < 1.00$.

Normality Test

The normality test was conducted to analyze whether the pretest and posttest data were normally distributed. The results are presented below.

Table 17. Shapiro-Wilk Test Results

Variable	Statistic	df	Sig.
Pretest digital literacy	0.928	16	0.230
Posttest digital literacy	0.929	16	0.235

The Shapiro-Wilk test was used because the sample size was less than 50. The results show that the significance value for the pretest was 0.230 and the significance value for the posttest was 0.235. Both values are greater than 0.05, indicating that the data were normally distributed. The analysis therefore proceeded to the homogeneity test.

Homogeneity Test

The homogeneity test was conducted to assess the equality of variance in the data. The test was performed on the pretest and posttest scores. The results are presented below.

Table 18. Test of Homogeneity of Variances

Variable	Levene Statistic	df1	df2	Sig.
Digital literacy improvement scores	2.526	1	30	0.122

The significance value of 0.122 was greater than 0.05, indicating that the data variances were homogeneous. Since the tested data were normally distributed and homogeneous, the analysis proceeded to the t-test.

Paired-Samples t-Test

The paired-samples t-test was conducted to determine changes in students' digital literacy by comparing the pretest and posttest scores. The results are summarized below.

Table 19. Paired-Samples t-Test Results

Pair	Mean Difference	SD Difference	t	df	Sig. (2-tailed)
Posttest – Pretest	41.25	8.062	20.466	15	0.000

The paired-samples t-test was used because the two sets of data were related, namely pretest scores before the implementation of the media and posttest scores after the implementation. The decision criterion was that a significance value below 0.05 indicated a significant difference, whereas a significance value above 0.05 indicated no significant difference. The test result showed a significance value of 0.000, which is below 0.05. This result indicates a significant difference between the students' pretest and posttest scores, demonstrating an improvement in students' digital literacy.

Evaluate and Revise

This stage is the final stage of the ASSURE model. Based on expert evaluations as well as suggestions from validators, revisions were made to improve the media so that it would be more effective and of higher quality. The material expert suggested improving the presentation of the teaching material by enlarging the font on the Pancasila symbols and providing examples of the meaning of Pancasila in everyday life. The learning media was considered good, although several minor revisions were needed to improve its quality. The media revisions included adding a digital literacy barcode related to the selected material and printing the media in card form to facilitate students' learning activities.

Table 20. Product Revisions Based on Expert Suggestions

Aspect	Suggestion	Revision Made
Material display	Enlarge the font on the Pancasila symbols.	The font size on the Pancasila symbols was enlarged.
Material content	Provide the meaning of Pancasila with examples from everyday life.	Examples of the meaning of Pancasila in daily life were added.
Digital literacy support	Add a digital literacy barcode related to the selected material.	A barcode was added to support access to digital literacy material.
Learning practicality	Print the media in card form to make it easier for students to use during learning.	The media was prepared in printed card form to support classroom implementation.

DISCUSSION

Validity of the Educaplay-Based Froggy Jump Media

The validity of the media was assessed by experts who had competence in their respective fields. The total score obtained from the assessment was converted into a percentage and then interpreted using predetermined criteria. The validity of the Educaplay-based Froggy Jump media was tested through a product validation questionnaire administered to material and media experts. Product validity from the perspective of media experts was assessed using validation sheets covering content feasibility and technical feasibility. Meanwhile, product validity from the perspective of material experts was measured using validation questionnaires covering content feasibility and presentation aspects.

1. Media Validation

Based on the assessment conducted by Mr. Fernandiksa Rasta Putra Pratama, M.Pd., the Educaplay-based Froggy Jump learning media obtained a questionnaire score of 49 with a percentage

of 98%, which falls into the "highly valid" category. This result indicates that the media was appropriate in terms of both content feasibility and technical feasibility. Therefore, the Educaplay-based Froggy Jump media was declared valid and implementable in the fourth grade of SDN Kaligambir 02.

2. Material Validation

Based on the assessment conducted by Mr. Trio Arista, M.Pd., the Educaplay-based Froggy Jump learning media obtained a score of 49 with a percentage of 98%. This result placed the media in the "highly valid" category, indicating that all assessed aspects were at a very good level and could support students' understanding. Thus, the media was declared valid for use in fourth-grade learning at SDN Kaligambir 02, Blitar Regency.

Feasibility of the Educaplay-Based Froggy Jump Media

The feasibility of the Educaplay-based Froggy Jump media was tested using a feasibility questionnaire. The questionnaire was completed by the fourth-grade teacher of SDN Kaligambir 02, Blitar Regency, Mrs. Krisma Dewi Firdaus, S.Pd. Product feasibility was assessed based on content, language, and presentation. The questionnaire score was 49 with a percentage of 98%. This result falls into the "highly feasible" category because it is within the range of 81%-100%. Therefore, the Educaplay-based Froggy Jump media can be implemented in the fourth grade of SDN Kaligambir 02.

Educaplay-Based Froggy Jump Media for Improving Students' Digital Literacy

The improvement in digital literacy was measured through pretest and posttest stages and then analyzed using a paired-samples t-test. The researcher carried out the learner participation stage over three meetings. In the first meeting, students completed the pretest before the treatment. Overall, students' scores at this stage were still low. Therefore, in the second meeting, the researcher implemented the Educaplay-based Froggy Jump learning media to deepen students' understanding of the material while also improving their digital competence. In the third meeting, the posttest was conducted to measure students' final ability after the implementation of the media. At this stage, students showed a significant improvement, with overall scores higher than those obtained in the pretest. This finding is consistent with Fatih et al. (2025), who state that innovative digital learning media play an important role in improving the quality of teaching and learning in elementary schools. The digital literacy improvement test was administered to 16 fourth-grade students of SDN Kaligambir 02. The paired-samples t-test produced a significance value of 0.000, which is below 0.05. This finding is in line with Fatih et al. (2022), who state that the development of technology-based teaching media has a positive effect on the learning process and students' learning outcomes.

The results of this study indicate that the use of Educaplay-based Froggy Jump learning media is effective in improving students' digital literacy. This effectiveness can be explained through gamification theory, in which game elements such as points, challenges, and feedback can increase students' learning motivation and engagement. Ruja (2025) explains that gamification creates a more engaging and interactive learning experience, encouraging students to actively explore learning material independently. The findings of this study show that the use of the learning media affected both the learning process and learning outcomes. This is consistent with research stating that gamification can significantly increase student engagement and learning outcomes in digital learning. Educaplay-based Froggy Jump media can therefore improve students' digital literacy. This conclusion is supported by the significant improvement in pretest and posttest scores. The learning media helped students understand the material more deeply during the learning process while also improving their digital literacy.

CONCLUSION

The Educaplay-based Froggy Jump media for the topic of the meaning of Pancasila principles in society for fourth-grade students was developed using the ASSURE research model. Students' digital literacy improved after the implementation of the Educaplay-based Froggy Jump learning media. This improvement can be seen from the mean pretest score of 38.75 and the mean posttest score of 80.00. The normality and homogeneity tests showed significance values above 0.05, while the paired-samples t-test showed a significance value below 0.05. These results indicate a statistically significant difference between students' pretest and posttest scores. Therefore, the use of Educaplay-based Froggy Jump learning media on the meaning of Pancasila principles in society can improve students' digital literacy.

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