



## **Development of Android-Based E-Comic as a Learning Media for Pancasila Education to Improve Learning Outcomes for Class V Elementary Schools**

**Elsa Nasywa Charisa\***

**Moh. Fathurrahman**

Elementary School Teacher Education, Faculty of Education and Psychology, Universitas Negeri Semarang - Jl. Raya Beringin No.15, Wonosari, Kec. Ngaliyan, Kota Semarang, Central Java

\*Corresponding author, E-mail: [elsanasywacharisa@students.unnes.ac.id](mailto:elsanasywacharisa@students.unnes.ac.id)

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### **Abstract**

Improving student learning outcomes through the use of learning media is the focus of research, which also highlights the importance of recent innovations in this field. This research uses the research and development (R&D) method with the ADDIE model, which includes: analysis, design, development, implementation, and evaluation. The subjects of this research were twenty-four fifth-grade students from Pati Regency. The results of observations, interviews, questionnaires, and documentation were used to collect data. Data analysis techniques include feasibility tests, product validity tests, data normality tests, and paired sample t-tests. Media and material validation resulted in an average score of 94.37%, placing it in the "very appropriate" category. The validation results obtained were 97.75% of teachers and students in the "very feasible" category in terms of product suitability. The research results show that the average score of class V students increase after the use of learning media. Thus, the results of research in the Pancasila Education subject, which carries the material "Getting to Know the History of the Unitary State of the Republic of Indonesia (NKRI)," can be improved through the use of e-comics based on Android devices.

**Keywords:** e-comic; instructional media; android; learning outcomes

### **INTRODUCTION**

Learning innovation is crucial for improving the quality of education in Indonesia, especially in science and technology (Rahayu, Iskandar, et al., 2022). Education in Indonesia requires technological advances to reach diverse regions (Rachmatullah & Purwani, 2022). Based on the 1945 Constitution Number 31 Paragraph (1), that every citizen has the right to an education that fosters independence and responsibility, which can improve living standards (Kurniawati, 2022). Currently, the merdeka curriculum is used as a reference in the learning process from elementary to secondary. In this Merdeka Curriculum, teachers are given greater confidence in planning learning, examining students' needs and adapting to existing conditions and assisted by encouragement from driving schools that can encourage the success of the merdeka curriculum (Rahayu, Rosita, et al., 2022). So teachers can be given flexibility in learning by looking at students' abilities and conditions (Vhalery et al., 2022). This will certainly increase the quality of education in Indonesia to make it more advanced and keep up with the times. Teachers play an important role in deciding the life progress of their students (Anggraini et al., 2022).

In connection with the Merdeka curriculum regulated in Minister of Education and Culture Regulation No. 12 of 2024, the SD/MI and equivalent curriculum structure includes intracurricular, co-curricular and extracurricular components. According to (Stidki & Pamekasan,

2020) these components consist of: (1) Intracurricular are learning activities that are scheduled and have a lesson load. (2) Co-curricular are additional activities related to understanding core material. (3) Extracurricular activities are activities that aim to hone students' interests, talents and abilities outside of core learning which are developed outside of learning hours. In the Pancasila Education curriculum, learning objectives on students is very large, determining appropriate learning objectives can determine the achievement of learning outcomes in the classroom (Sanjani, 2021). In the Pancasila Education Teacher's Guidebook published by the Ministry of Education and Culture in 2022, Pancasila Education certainly has educational goals which include the goal of forming students who are faithful, devoted to God Almighty, have noble character, global diversity, work together, be independent, reason critically and are creative. Educators should be required to play an active role and have high creativity to make learning more interactive and not boring, one of which is by using learning media (Laksana, 2021). 21st century capabilities also encourage technological advances for elementary school students so that they can support learning (Rahayu, Iskandar, et al., 2022). Students are more likely to understand lesson material when they use learning media, which supports the achievement of learning goals (Fadilah et al., 2023). Effective use of learning media is one way to increase the possibility of achieving learning goals. Messages that students deserve to hear are delivered through learning media, which has a unique function in the learning process (Candrayani et al., 2024).

Learning media is a teacher's tool that cannot be abandoned. The use of supporting facilities such as learning media will make it easier for students to understand and focus on learning in the class (Hasan et al., 2021). Based on the results of observations, variation and innovation in learning media are very important for the development of learning, according to researchers. Teachers must also have the proper will and potential to create variations in learning media so that they are not just monotonous in using learning books. This learning innovation will be centered on students, which will improve their learning outcomes in the classroom. Learning media itself has an important role in conveying information to message recipients through something that is quite useful in it (Trisiana et al., 2020). Attractive, technology-based e-omic media is one of the many new forms of educational media. One type of media that has the potential to attract students and improve their learning outcomes is digital comics, often known as e-comics (Payanti, 2022). In e-comics, students can read, listen to material, understand material and memorize material which is more easily accepted by students (D. A. Putri et al., 2023). The use of technology-based media can attract students' attention in understanding material (Sari & Wicaksono, 2022).

The results of observations carried out by researchers found information obtained through interviews with class V teachers at SDN Kayen 04, Pati Regency, explaining that there were limited interesting learning media in activating students' cognitive abilities, especially in the subject matter of Pancasila Education. It can be concluded that the use of Android-based E-Comic learning media has never been applied at all in learning in this class. Learning stages in the classroom tend to lack use of digitalization of learning, making learning in it saturated. Class teachers tend to use learning media in the form of text and images contained in textbooks or student worksheets. The results of this observation found that the class teacher had not met good standards in implementing learning in the classroom. In this case, the researcher conducted this research with the aim of increasing students' understanding of the history of the Republic of Indonesia. The researcher in this example tried to create learning media. The media developed

combines visualization of cartoon images telling stories and learning materials where both of these things can be accessed using Android. The new learning media is in the form of an e-comic which will be equipped with a barcode that can be scanned on each student's Android on the *Google Lens* website.

In previous research that was researched by Rahmadani & Wicaksono (2023) with the title "Development of Digital Comic Learning Media in Pancasila Educational Content, Material on Socio-Cultural Diversity in Indonesia" is the same as research conducted by Toma & Reinita (2023) with the title "Development of *Canva* Learning Media Based on the PBL Model in Class IV Elementary Schools". And also research conducted (Fitri et al., 2023) with the research title "Development of Digital Comics to Improve Learning Outcomes on Pancasila Values Material for Class IV Elementary School Students". The similarity found from previous research is that it has similarities to the development of digital comics designed using *Canva* which uses development research or what is called Research and Development (R&D) in elementary schools. The difference in this study lies in the development of Android-based e-comic media that focuses on the material "Understanding the History of the Republic of Indonesia" in the Pancasila Education subject. This is different from previous studies that only focused on static digital comics developed with *Canva*, without interactive features. The gap in previous studies is the lack of Android-based interactive digital comics that integrate additional features such as barcode scanning to increase student engagement and the latest technology. This study aims to fill this gap by developing Android-based electronic comics that combine storytelling with interactive elements to improve students' understanding of Indonesian history.

Based on the background and research that can be used as a reference, the researcher examines the research through research and development (R&D) with the title "Development of Android-Based E-comic as a Learning Media for Pancasila Education to Improve Class V Elementary School Learning Outcomes". It is hoped that the learning media developed will be able to improve student learning outcomes, especially in the Pancasila Education subject, the material "Getting to Know the History of the Republic of Indonesia" which can make it easier to understand the content of the material, memorize and improve learning outcomes well at elementary school level.

## **METHOD**

This research uses Research and Development (R&D) by developing a product that has several stages and has fulfilled and arrived at product evaluation. The development carried out by researchers is the development of an innovative Android-based e-comic. The method used in this research is ADDIE which consists of 5 stages. ADDIE can be interpreted as analysis, design, development, implementation and evaluation. The stages that must be followed in this research method are analyzing the needs found, designing a product to be developed, developing the product, putting it into practice in learning, evaluating the product to become a complete finished product that has high quality (Latip, 2022).

The first is the analysis stage to see existing needs. The analysis carried out includes many things, including analysis of learning needs, learning media needs, learning process needs, analysis of teaching materials in it and analysis of learning quality standards in the classroom. The use of E-Comic learning media has also never been taught in this class. Students' learning

experiences in class, implementation of learning, and learning processes in class were found to have less than optimal results. This can be seen from observations made by researchers, to analyze the needs analysis for students.

The second stage is design, where at this stage the researcher begins to design the product that will be developed regarding E-Comic with the content of Pancasila Education in Class V Elementary School. The media designed by this researcher is the development of an Android-based E-Comic product that is easily accessible to students. Some of the design scope contained in it is that the content in this e-comic consists of the beginning, body and ending. The first section will display the name of the e-comic, teaching materials, learning objectives and instructions for using the e-comic. Meanwhile, the content section will contain the names of the characters and the material that the researcher will present via e-comic. This content section will be divided into 3 parts to make it easier for students to understand e-comics. Meanwhile, the closing section contains a bibliography, researcher profile and thanks. Next, development is the stage that is taken to develop a product so that it meets good standards. The stages involved are media and material validation stages which are carried out by expert lecturers who are professionals in their fields. Learning media developed by researchers must go through a validity test carried out by expert lecturers. If the learning media is valid then it can be applied in learning. However, if the learning media is not yet valid, revisions must be made until it is declared valid and accepted. This stage will later influence the quality of the media development carried out.

After carrying out the development stages, the stage carried out is implementation. This stage is carried out to carry out implementation in learning. In this research, researchers applied it at SDN Kayen 04 with a total of 24 students. This implementation goes through several processes that must be fulfilled. First, a process needs to be carried out to prepare adequate facilities and infrastructure. Such as monitors, speakers, androids used by students, laptops and others. After several processes have been fulfilled, the next step is implementing learning media in the classroom. The final stage that researchers must go through is the evaluation stage. This evaluation is carried out to see whether the learning media applied has an influence or not. This evaluation is carried out by distributing response questionnaires which must be filled out by students and class teachers. Apart from that, the results of the pretest and posttest also influence whether the results of implementing learning media in the class can be declared successful or not. This success will be seen in the final stage, namely evaluation. In the research that will be carried out, the researcher took subjects consisting of 2 expert validators from material and language, then the class teacher and involved 24 students in class V of SD Negeri Kayen 04, Pati Regency. Data obtained from validation and questionnaire results will be analyzed through the application of a Likert scale. The score results obtained through the previous data collection stage obtained from filling in the validity questionnaire will then be measured to obtain the percentage explained as follows.

$$NP = \frac{R}{SM} \times 100$$

Information :

NP = percent value being searched for  
R = score obtained  
SM = maximum score  
100 = fixed value

Media validity and learning practicality categories are obtained from the final scores presented in table 2:

**Table 2. Category of validity of learning media**

Intervals	Category
86-100%	Very Appropriate
76-85%	Appropriate
60-75%	Fairly Appropriate
55-59%	Less Appropriate
00-54%	Inappropriate

Source: (Purwanto, 2013)

**Table 3. Category of practicality of learning media**

Intervals	Category
86-100%	Very Practical
76-85%	Practical
60-75%	Quite Practical
55-59%	Less Practical
00-54%	Not Practical

Source: (Purwanto, 2013)

### **Research Design**

The type of research carried out by researchers is Research and Development. According to Sugiyono (2017) R&D research is research that is used to create a new product which is used to produce results and test a product that has been innovated. Based on the ADDIE methodology, which stands for analysis, design, development, implementation, and evaluation, this study follows these processes. When developing innovative products, educators and learning media designers often use the ADDIE model (Hidayat & Muhamad, 2021). This learning innovation has an attractive and interactive design so that it can be well received by students to support learning outcomes in a lesson. To determine whether the learning materials created were appropriate, the researchers conducted experiments by developing media and materials before using them in class.

### **Research Subjects**

The research subjects focused on by the researcher were 24 class V students at SDN Kayen 04 Pati Regency. Where the sample used for the small scale test was 6 students and the large scale test was 18 students. So, the entire population that underwent this learning media treatment was 24 class V students at SDN Kayen 04, Pati Regency. The source material for this research comes from the 2nd semester Pancasila Education course, namely Understanding the History of the Republic of Indonesia. E-comic learning media developed for the Android platform will be used to innovate the content that will be presented. The design developed has a digital comic design with animated cartoon images equipped with interesting stories according to the learning material. Researchers designed this e-comic using the *Canva* application which was then developed into a storytelling comic. In this E-Comic, a *QR-Code* will be provided which can be scanned by students using *Google Lens* on their respective smartphones. After that, students will read and understand e-comics with story animations which are equipped with learning materials to test learning outcomes from the Getting to Know the History of the Republic of Indonesia material.

### ***Instrument Collection and Development Techniques***

This research used as research subjects 24 students in class V of SDN Kayen 04, Pati Regency. The researcher specializes in the material "Getting to Know the History of the Republic of Indonesia" which is included in the Pancasila Education subject in Semester 2. The learning media used to support improving learning outcomes in this lesson is an Android-based e-comic which attracts students to study it. The design used for this learning media is the *Canva* application. This e-comic product has a large display when used on Android or laptop. The content in this e-comic consists of the beginning, body and conclusion. The first section will display the name of the e-comic, teaching materials, learning objectives and instructions for using the e-comic. Meanwhile, the content section will contain the names of the characters and the material that the researcher will present via e-comic. This content section will be divided into 3 parts to make it easier for students to understand e-comics. Meanwhile, the closing section contains a bibliography, researcher profile and thanks.

In the process of creating e-comics, this research follows the 5 steps of the ADDIE model for research and development. There are several steps involved in developing a product, starting with analysis, moving on to design, development, and finally, implementation, and finally, assessment, which determines the outcome of the development process.

## **RESULTS AND DISCUSSION**

The ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation, was used in the creation of android-based e-comic learning media, where the development process goes through the following stages.

### ***Analysis Stage***

Researchers conducted observations at SDN Kayen 04 Pati Regency and SDN Kayen 06 to identify challenges in teaching material "Getting to Know the History of the Republic of Indonesia" in the content of Pancasila Education. The findings showed that teachers relied mainly on print media and books, leading to students disinterest and boredom in learning. Teacher noted that the Pancasila Education subject was more difficult for class V students to understand because of the many dates of important events, names of figures and the sequence of events in the History of Independence. Especially in the material about Getting to Know the History of the Unitary State of the Republic of Indonesia (NKRI), which requires the ability to memorize, making this material particularly challenging. This situation highlighted the need for innovative learning tools to engage students and improve outcomes. To address this, researchers proposed developing Android-based interactive e-comic media to support learning and make the material more engaging. This idea was reinforced by a needs questionnaire administered to 24 class V students and their teachers at SDN Kayen 04, revealing that most students preferred digital media and had never encountered e-comic resources before. Both teachers and students strongly supported the introduction of this new media, confirming the urgent need to develop Android-based e-comic learning media to enhance classroom learning outcomes.

## Design Stage

This research stage follows the analysis stage, which identifies the problems that need to be addressed. The researcher adjusted the material for the topic "Getting to Know the History of the Republic of Indonesia," aligning it with Pancasila Education learning objectives and teaching modules in Chapter 4 of "My Country, Indonesia." In the next stage, the researcher created e-comic learning media using *Canva*, designing characters, dialogues, and layout to produce a downloadable PDF.

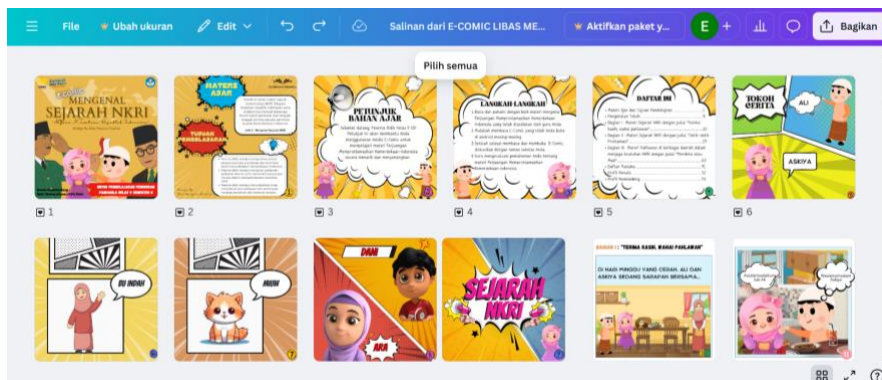


Figure 1. Process of making e-comics using the *Canva* application

After that, the stage of making flip books and barcodes using *fliphtml5* website, allowing students to easily access the e-comics via Android devices. The design process emphasized clear character placement, color choice, and font selection to enhance student readability and engagement. Barcodes were generated to streamline access, and the final comic drafts were uploaded as flipbooks for distribution.

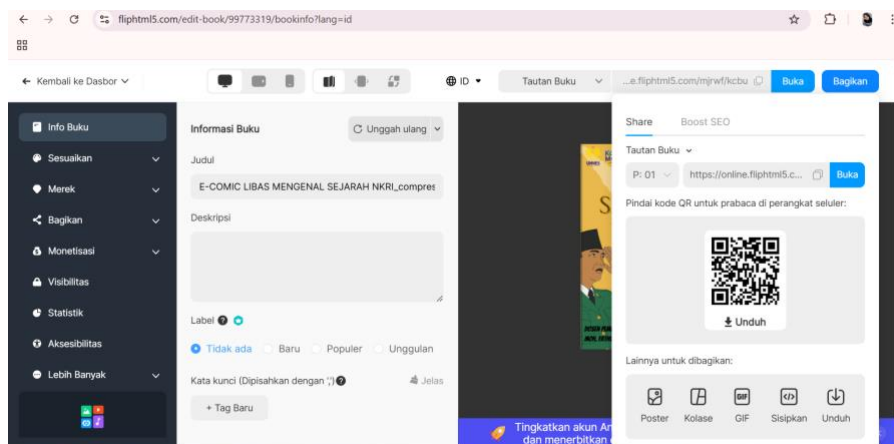


Figure 2. The process of making flip books and barcodes using the *fliphtml5* website

## Development Stage

At this stage, the researcher has created a complete product and paid attention to every detail of the e-comic. Researchers also present this development product in the final e-comic process so that this media product can be used properly and well for students and class teachers. During this phase, researchers also conduct product testing with professional media and material

experts. Assessments carried out by media and materials experts can provide further suggestions and direction regarding the learning media being developed. The presence of this e-comic can support students' activeness in understanding learning material where they can learn while reading animated cartoons that are interesting and not monotonous (Andre et al., 2023).

**Table 4. Media Expert Validator Results**

Media Validator	Value Obtained	Maximum Value	Presentation	Category
	60	64	93,75%	Very Appropriate

**Table 5. Material Expert Validator Results**

Material Validator	Value Obtained	Maximum Value	Presentation	Category
	76	80	95%	Very Appropriate

It can be seen from these two tables that it can be concluded that 93.75% of media experts and 95% of material experts met the validity requirements. Because the average is 94.37%, it can be concluded that E-Comic media is included in the "Very Appropriate" criteria and is included in the valid category for implementation in classroom learning (Purwanto, 2013).

### **Implementation Stage**

The implementation stage was conducted on January 13 –17 2025. Before using Android-based e-comics, students were directed to connect their devices to the internet and scanned the e-comic barcodes using *Google Lens* to access the flipbook version of the material "Getting to Know the History of the Republic of Indonesia". To measure students' initial knowledge of the subject, students must completed a pre-test before being introduced to the e-comic. Researcher then implemented the learning module and guided students to use the e-comic product. After reading and understanding subject with the e-comic, students asked to completing a post-test to compare their learning outcomes. At the final stage of implementation, students asked to filled out a questionnaire to evaluate the product's quality. The presence of this e-comic can support students' activeness in understanding learning material where they can learn while reading animated cartoons that are interesting and not monotonous (S. Y. Putri et al., 2023).



**Figure 3. E-Comic Implementation Process in Class**

Next, the assessment of the student response questionnaire was carried out on 24 class V students at SDN Kayen 04 which was carried out on January 16, 2025. The student response questionnaire consists of 20 aspects that are assessed, namely presentation of material, media appearance, language, writing, color, stimulus produced, media interest and material in learning media.. Based on the results of practical calculations for 24 students, a percentage of 97.5% was obtained, which is included in the "very practical" category. Supported by previous research, the use of e-comic media is very innovative and interesting when applied in the classroom (Muflihah et al., 2024).

### ***Evaluation Stage***

In this final stage, the evaluation focused on the practicality and effectiveness of the developed Android-based e-comice. Practicality was assessed through teacher and students response questionnaires. On January 16, 2025, the result of practicality test by class V teachers and students at SDN Kayen 04, Pati Regency, obtained a result of 98,75%. Based on the modification of the practicality category (Purwanto, 2013), the percentage values for the two questionnaires are in the interval 86% - 100%, including the very practical category. Teachers noted the media was accessible, engaging, and helpful, though minor improvements were suggested. Supported by previous research, the use of e-comic media is very innovative and interesting when applied in the classroom (Muflihah et al., 2024).

After the product was developed through the ADDIE stages, its effectiveness was tested with the following results.

**Table 6. Descriptive statistics pretest and posttest results**

Measurement	N	Reach	Minimum	Maximum	Average	Std. Deviation	Varians
Pre-test	18	33	43	76	56.89	10.289	105.869
Post-test	18	17	76	93	83.89	6.388	40.810

Comparison of pre- and post-test scores revealed statistically significant changes, as shown in the data mentioned on Table 6. It is known that the value obtained which has a minimum value of 43 and a maximum value of 76 has an average of 56.89 which has a standard deviation of 10,289 which is very significant and a variance of 105,869. Meanwhile, it can be seen in the posttest where the minimum score obtained was 76 to 93. This means that the average obtained was 83.89 with a very heterogeneous standard deviation, namely 6,388 with 40,810 variance. From the analysis of the data processing results above, it can be interpreted that there was an increase in the posttest scores applied after using e-comic learning media.

### **Data Normality Test**

In addition, the pre- and post-test results were checked using the normality test. The main goal of this test is to determine whether the current data follows a normal distribution. Therefore, the Shapiro-Wilk test was carried out before the t-test was carried out. Field (2013) provides direction that data normality checks need to be carried out as a benchmark for the success of a study. In order for the analysis with paired samples t-test to produce valid information regarding the influence of Android-based e-comic learning media on learning outcomes, it is important to ensure that the data has a normal distribution.

**Table 7. Shapiro-Wilk Normality Test on Pretest and Posttest**

Measurement	Statistics	df	Sig. (p-value)
Pre-test	0.939	18	0.279
Post-test	0.881	18	0.027

The Shapiro-Wilk normality test was applied by getting a statistical value in the pre-test of 0.939 with degrees of freedom of 18 and getting a  $p_{\text{value}}$  of 0.279, which can be interpreted as 0.279 being greater than 0.05, meaning it is normally distributed. The posttest value after treatment on the E-Comic learning media shows that the statistics are 0.881 with 18 degrees of freedom at a  $p_{\text{value}}$  of 0.027 > 0.05. The posttest value shows that the distribution means normal. This means that normally distributed data can be continued for further testing to find out how effective the application of e-comic learning media is in learning. Pradnyasari et al., (2024) explained that e-comics media can increase students' interest in learning and learning outcomes by combining interesting visual narratives with learning materials.

### Paired Samples Test (T-Test)

The t-test can be used to determine whether the hypothesis is correct or whether two groups are significantly different and connected. When dealing with regularly distributed data, this testing becomes feasible.

**Table 8. Paired Samples Shapiro-Wilk Test on Pretest and Posttest**

Measurement	Average	Sig. (2-tailed)
Pre-test	56.8889	0.000
Post-test	83.8889	

From the data shown in table 8, the pretest measurement results show an average value of 56.89 and the average result of the posttest is 83.89, which can indicate an increase in the average of the paired sample t-test. The significance value (2-tailed) shows that  $0.000 < 0.005$  which contains the conclusion that  $H_0$  is rejected and  $H_a$  is accepted.

## Discussion

### *Feasibility of Android-Based E-Comic Media in Class V Pancasila Education Subjects*

In this research, the researcher developed a product in the form of an e-comic that is suitable for use by students in Pancasila Education learning in class V. In this process, the quality of the media content and the suitability of a product can be determined if it is developed and implemented in the classroom. Experts in the field of media and related materials will then evaluate the final product in terms of quality. It is hoped that the product development carried out by researchers meets the curriculum standards applicable at the school. The media and material validation process is carried out by experts in the field and experienced to obtain improvements and input needed for this comic media. Based on the feasibility test, it can be concluded that media experts give a score of 93.75% and 95% for material experts, where both assessments meet the existing requirements and have very appropriate criteria. If averaged, it will produce a score of 94.37%, so it is included in the "Very Decent" criteria. This shows that this e-comic learning media can meet the criteria that can be applied in elementary schools. Previous research also

shows that the development of e-comic media can improve students' learning outcomes in the classroom because they can learn new things that they have not received before.

In previous studies, the development of e-comic media has also been shown to improve student learning outcomes in the classroom because they can learn new concepts in a more interesting and interactive way. For example, Rahmadani & Wicaksono (2023) research developed *Canva*-based digital comic media for Pancasila Education which was proven to improve students' understanding of socio-cultural diversity material. Meanwhile, Toma & Reinita, (2023) research showed that the use of *Canva* media based on the Problem-Based Learning (PBL) learning model in grade IV can increase students' interest in learning. The difference with previous studies is that the development of e-comic media developed by researchers is more varied and interactive by using Android as a form of technological progress linked to education. With these innovative features, students can be more active in exploring the material to improve their learning understanding to gain a deeper learning experience.

In addition, this study also shows that the use of Android-based e-comics is more flexible because it can be accessed via mobile devices without requiring a stable internet connection. This is a solution for areas that have limited internet access. Thus, this study not only adds references in the field of digital learning media development but also provides a real contribution to improving the quality of education in Indonesia, especially in learning Pancasila Education at the elementary school level. Overall, the results of this study strengthen previous findings that Android-based e-comic media has a positive impact on improving student learning outcomes. However, with the development of Android-based interactive features, this study provides further innovation that can be a reference for the development of digital learning media in the future. For further research, it is expected to test the effectiveness of this e-comic media in a longer period and develop additional features, such as animation or interactive elements, to increase the appeal and involvement of students in learning.

### ***The Effectiveness of Android-Based E-Comic Media in Class V Pancasila Education Subjects***

The results of the learning evaluation show that determining effectiveness can use pre-tests and post-tests carried out on implications in the field. The application of the pre test was carried out before treatment of the e-comic learning media, while the post test was carried out after the application of the e-comic learning media. Knowing this, the comparison results of the pretest and posttest will be able to determine whether there is an increase in the application of e-comic media. Based on Komang et al. (2021), e-comic media greatly encourages students' activeness in understanding learning materials, because the ongoing learning innovation provides interactive learning. In addition, Khoiri et al. (2024) conducted research using e-comic media and played an important role in fostering student motivation in modern learning. In this case, a comparison of the pre-test and post-test makes it possible to determine that there is an increase in student understanding after using e-comic media by adding the results of previous studies as evidence of the effectiveness of using this learning media in education.

The results of this measurement can be a basic reference that after implementing the android-based e-comic learning media treatment on the second semester Pancasila education content in class V shows a significant average difference. After the e-comic media was implemented in learning, the average score increased to 83.89, which showed a significant increase in learning

outcomes. The paired samples t-test method was used to compare two paired samples, so that changes in larval density scores could be evaluated before and after educational intervention. This analysis plays a role in determining whether the differences that occur have statistical significance (Field, 2013). This increase is in line with several previous studies that the development of e-comic media has had a positive impact on learning success (Narestuti et al., 2021).

### ***Product Advantages and Weaknesses***

The development of e-comic media in this research showed significant results in the sense that the product developed succeeded in improving student learning outcomes. One of the advantages of this media is that the display presented is attractive and innovative. The illustrations depicted from the conversations of the animated characters in it make this e-comic easy for students to understand. The illustrations depicted from the conversations of the animated characters in it make this e-comic easy to understand for students. In this android-based e-comic, the software used includes *Canva*, *Adobe Illustrator*, and *FlipHTML5* to design the layout, illustrations, and create an e-comic format that can be easily accessed on android devices. The colors used in this e-comic are dominated by bright combinations and high contrast to attract students' attention and make it easier to read. The illustrations in the e-comic are made in a simple cartoon style, featuring main characters such as Ali and Askiya who play a role in guiding students to understand the history of the Republic of Indonesia. The layout is designed so that the storyline is easy to follow, with text that is not too dense and uses a 14–16 pt font for comfortable reading. This e-comic has three main sections, namely “Thank You, O Heroes,” “Seconds of the Proclamation,” and “Freedom or Death,” which contain information about historical events, heroic figures, and the values of the struggle in defending the Republic of Indonesia. Each section is arranged in several interactive pages that encourage students to read and discuss. In addition, interactive features such as simple animations and learning steps that involve discussions with friends are also added to improve student understanding. Before being used in learning, this e-comic has been validated by material and language experts to ensure its suitability with the curriculum and readability for elementary school students. With these various considerations, the e-comic "Getting to Know the History of the Republic of Indonesia" is expected to be an interesting, interactive, and effective learning media innovation in helping students understand and apply the values of Pancasila in everyday life.

The use of digitalization, which is highly recommended in the merdeka curriculum, supports the use of e-comics implemented in the classroom (Marisa, 2021). However, there are several limitations and challenges that need to be considered regarding this e-comic learning media. (Güney, 2023) argues that digital media has the potential to increase student engagement, but comes with certain challenges. Students who are less interested in reading tend to be less interested in this media. Another limitation that needs to be considered is the need for continuous learning innovation so that this media can be used continuously. The strategy that can be used to overcome this is teacher assistance to encourage students' understanding of historical concepts and the Pancasila values within them. Based on the results of each development stage in this research, e-comics have an important role in improving student learning outcomes. In the needs analysis stage, it was found that students were more interested in media packaging that was newer and had a design concept that was easy to understand. At the design stage it was adjusted to the cognitive level of class V students. This was also supported by the results of the teacher and

student questionnaire which reached 97.75% where this learning innovation was assessed as being able to improve learning outcomes in the classroom.

### ***Application of Android-Based E-Comic Media***

Android-based e-comic media can be used to add new innovations to education. In implementing the e-comic media developed by researchers, it is hoped that it can support more innovative learning in the future. According to (Fitriya Astutik & Suprijono, 2021), the use of e-comic media also influences the improvement of students' abilities in several ways, including the ability to understand, read, analyze and think more critically. The increasingly developing basis for learning innovation makes a good contribution to the sustainability of education in Indonesia. By using this development, teachers are required to develop their abilities, especially in learning innovation. Therefore, teachers do not only act as facilitators in the learning process, but are also required to continue to develop their competencies, especially in terms of learning innovation. Improving teacher skills in adopting and integrating technology into learning is a key factor in creating a more effective, relevant, and appropriate learning environment for students in the digital era.

Education that adapts to new circumstances is good education (Idhayani et al., 2023). This can be interpreted as meaning that in education teachers must evaluate themselves to improve the quality of education. This quality improvement can be applied to encourage educational progress. According to (Maharani et al., 2023), Android-based e-comic learning media is a quality learning innovation and has high academic value. This study also shows that the use of Android-based e-comics significantly increases student engagement in learning, especially in understanding the history and values of Pancasila. Based on the results of the needs analysis, it was found that students were more interested in innovative and interactive learning media. In addition, quantitative data showed that the average score of student understanding increased after using this media. The sustainability of this study can be done by exploring additional features, such as animated elements or direct interaction with the material to make it more interesting for students. In addition, the long-term effectiveness of the use of Android-based e-comics in Pancasila Education learning can be further studied to understand its impact on student learning outcomes more comprehensively. The results of this study are in line with previous studies which show that digital-based learning media, especially e-comics, can be applied in learning and have a positive impact on student learning outcomes (Sukma & Setyasto, 2024).

## **CONCLUSION**

### **Conclusion**

There is a significant increase in learning outcomes in Android-based e-comic media in the content of Pancasila Education Learning in the material "Understanding the History of the Unitary State of the Republic of Indonesia (NKRI)" for elementary school students. With a score of 93.75% from media experts and a score of 95% from material experts, the resulting learning media is considered "very feasible". With an average total score of 94.37% from professionals in the media and materials field. In terms of the effectiveness of this learning media, the teacher response was 98%, and the combined average of questionnaires filled out by class teachers and students was 97.75%, included in the "very practical" category. Thus, it can be concluded that Android-based e-comic media is not only an effective means of helping students understand the

subject matter, but is also a practical and innovative method for improving their learning outcomes.

### Suggestion

Researchers suggest that further research be carried out regarding the development of digital media in the form of e-comics or flipbooks in the Pancasila Education subject by adding more material to it. So that the development of learning media can continue to innovate to be even better. E-comic media products can also be used as innovations and alternatives in learning Pancasila Education in Class V Elementary Schools as learning supports that can be used by teachers. Therefore, teachers are expected to ensure that e-comic learning media align with basic competencies and assist students in understanding the content. The use of e-comics should be combined with discussions, reflections, and creative assignments to enhance its effectiveness. Additionally, teachers need to assess students' understanding and responses to improve the effectiveness of the media in learning.

### REFERENCE

- Andre, H., Jamiah, Y., & Rif'at, M. (2023). Pengaruh Media E-Comic Materi Aritmatika Sosial Terhadap Minat Belajar Siswa Smp. *Transformasi : Jurnal Pendidikan Matematika Dan Matematika*, 7(1), 15–26. <https://doi.org/10.36526/tr.v7i1.2464>
- Anggraini, D. L., Yulianti, M., Nurfaizah, S., & Pandiangan, A. P. B. (2022). Peran guru dalam mengembangkan kurikulum merdeka. *Jurnal Ilmu Pendidikan Dan Sosial*, 1(3), 290–298. <https://doi.org/10.58540/jipsi.v1i3.53>
- Candrayani, A. N., Ambarwati, Y. D., & Wibisono, H. (2024). Meta Analisis: Efektivitas Penggunaan Media Komik dalam Peningkatan Hasil Belajar Pendidikan Pancasila di Sekolah Dasar. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, 10(1), 1383-1397. <https://doi.org/https://doi.org/10.36989/didaktik.v10i1.2641>
- Fadilah, A., Nurzakiah, K. R., Kanya, N. A., Hidayat, S. P., & Setiawan, U. (2023). Pengertian Media, Tujuan, Fungsi, Manfaat Dan Urgensi Media Pembelajaran. *Journal of Student Research*, 1(2), 01-17, 1(2). <https://doi.org/https://doi.org/10.55606/jsr.v1i2.938>
- Fitri, A. S., Aeni, A. N., & Nugraha, R. G. (2023). Pengembangan Komik Digital Untuk Meningkatkan Hasil Belajar Pada Materi Nilai-Nilai Pancasila Siswa Kelas IV Sekolah Dasar. *Al-Madrasah: Jurnal Pendidikan Madrasah Ibtidaiyah*, 7(1), 220. <https://doi.org/10.35931/am.v7i1.1756>
- Fitriya Astutik, A., & Suprijono, A. (2021). *Pengembangan Media Komik Digital Dalam Pembelajaran IPS Sebagai Penguatan Karakter Peserta Didik Kelas V SDN Geluran 1 Taman*. <https://doi.org/https://doi.org/10.37081/ed.v9i3.2894>
- Güney, K. (2023). Considering the Advantages and Disadvantages of Utilizing Social Media to Enhance Learning and Engagement in K-12 Education. *Research in Social Sciences and Technology*, 8(2), 83–100. <https://doi.org/10.46303/ressat.2023.13>
- Hasan, M., Milawati, M., Darodjat, D., Harahap, T. K., Tahrim, T., Anwari, A. M., & Indra, I. (2021). *Media Pembelajaran*.
- Hidayat, F., & Muhamad, N. (2021). Model Addie (Analysis, Design, Development, Implementation and Evaluation) Dalam Pembelajaran Pendidikan Agama Islam Addie

- (Analysis, Design, Development, Implementation and Evaluation) Model in Islamic Education Learning. *J. Inov. Pendidik. Agama Islam*, 1(1), 28-37. <https://journal.uinsgd.ac.id/index.php/jipal>
- Idhayani, N., Nurlina, N., Risnajayanti, R., Salma, S., Halima, H., & Bahera, B. (2023). Inovasi Pembelajaran Anak Usia Dini : Pendekatan Kearifan Lokal Dalam Praktik Manajemen. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(6), 7453–7463. <https://doi.org/10.31004/obsesi.v7i6.5624>
- Khoiri, N., Lilyani, F. S. T., & Wijayanto, W. (2024). E-comic as a media to build an understanding of newtons concepts. *Momentum: Physics Education Journal*, 8(1), 154–165. <https://doi.org/10.21067/mpej.v8i1.8478>
- Komang, N., Tri, R., Udayani, K., Made, I., Wibawa, C., & Rati, N. W. (2021). Development of E-Comic Learning Media on the Topic of the Human Digestive System. *Journal of Education Technology*, 5(3), 472–481. <https://doi.org/10.23887/jet.v>
- Kurniawati, F. N. A. (2022). Meninjau Permasalahan Rendahnya Kualitas Pendidikan di Indonesia dan Solusi. In *AoEJ: Academy of Education Journal* (Vol. 13, Issue 1).
- Laksana, S. D. (2021). Pentingnya Pendidikan Karakter Dalam Menghadapi Education Technology The 21 st Century. *Jurnal Teknologi Pembelajaran*, 1(01), 14-22 <https://journal.iaimnumetrolampung.ac.id/index.php/jtep>
- Latip, A. (2022). Penerapan Model ADDIE Dalam Pengembangan Multimedia Pembelajaran Berbasis Literasi Sains. *DIKSAINS: Jurnal Ilmiah Pendidikan Sains*, 2(2), 102-108. <https://doi.org/https://doi.org/10.33369/diksains.2.2.102-108>
- Maharani, N., Lestari, S., & Suyanti, S. (2023). Pengembangan Media E-Comic Berbasis Proyek Pada Penguatan Profil Pelajar Pancasila Siswa Kelas IV. *Prosiding Konferensi Ilmiah Dasar*, 4, 2(2), 102–108. <http://prosiding.unipma.ac.id/index.php/KID>
- Marisa, M. (2021). Inovasi Kurikulum “Merdeka Belajar” di era society 5.0. *Santhet (Jurnal Sejarah Pendidikan Dan Humaniora)*, 5(1), 66-78. <https://doi.org/https://doi.org/10.36526/santhet.v5i1.1317>
- Muflihah, S., Zahra, S. F., Yuliani, D., & Irawati, I. (2024). Efektivitas Penggunaan Media Komik Digital Berbasis Canva Dalam Pembelajaran IPS Di SD Yapis 02 Manokwari. <https://doi.org/https://doi.org/10.36312/jcm.v3i3.3332>
- Narestuti, A. S., Sudiarti, D., & Nurjanah, U. (2021). Penerapan Media Pembelajaran Komik Digital untuk Meningkatkan Hasil Belajar Siswa. *Bioedusiana: Jurnal Pendidikan Biologi*, 6(2), 305–317. <https://doi.org/10.37058/bioed.v6i2.3756>
- Payanti, D. A. K. D. (2022). Peran Komik Digital Sebagai Media Pembelajaran Bahasa Yang Inovatif. In *Sandibasa I: Seminar Nasional Pendidikan Bahasa Dan Sastra Indonesia I* (Vol. 4, pp. 464-475).
- Pradnyasari, I. G. A. M. W., Gading, I. K., & Bayu, G. W. (2024). Modernizing Education: Empowering the Potential of E-Comic Media for Improved Learning Interest and Learning Outcomes. *Jurnal Pedagogi Dan Pembelajaran*, 7(1), 112–123. <https://doi.org/10.23887/jp2.v7i1.66711>
- Purwanto. (2017). Evaluasi Hasil Belajar. Yogyakarta: Pustaka Pelajar.

- Putri, D. A., Rohmanurmeta, F. M. R., & Hadi, F. R. (2023). Manfaat Media Komik Digital Sebagai Upaya Pemberdayaan Keterampilan Berpikir Kritis Abad 21 Pada Pembelajaran IPA di Sekolah Dasar. *Prosiding Konferensi Ilmiah Dasar*, 4, 896-901. <http://prosiding.unipma.ac.id/index.php/KID>
- Putri, S. Y., Hamdina, W., Yani, M. D., Yanti, M. Y., & Satria, T. F. (2023). Pengaruh Media Komik Digital dan Media Teks Multimodal Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Dasar*, 8(3), 6650-6662. <https://doi.org/https://doi.org/10.23969/jp.v8i3.12053>
- Rachmatullah, N., & Purwani, F. (2022). Analisis Pentingnya Digitalisasi & Infrastruktur Teknologi Informasi Dalam Institusi Pemerintahan : E-Government. *Jurnal Fasilkom*, 12(1), 14-19. <https://doi.org/https://doi.org/10.37859/jf.v12i1.3512>
- Rahayu, R., Iskandar, S., & Abidin, Y. (2022). Inovasi Pembelajaran Abad 21 dan Penerapannya di Indonesia. *Jurnal Basicedu*, 6(2), 2099–2104. <https://doi.org/10.31004/basicedu.v6i2.2082>
- Rahayu, R., Rosita, R., Rahayuningsih, Y. S., Hernawan, A. H., & Prihantini, P. (2022). Implementasi Kurikulum Merdeka Belajar di Sekolah Penggerak. *Jurnal Basicedu*, 6(4), 6313–6319. <https://doi.org/10.31004/basicedu.v6i4.3237>
- Rahmadani, C. R., & Wicaksono, V. D. (2023). Pengembangan Media Pembelajaran Komik Digital Dalam Muatan Pendidikan Pancasila Materi Keberagaman Sosial Budaya Di Indonesia. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 11(10), 2172-2182.
- Sugiyono (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung : Alfabeta.
- Sanjani, M. A. (2021). Pentingnya Strategi Pembelajaran Yang Tepat Bagi Siswa. In *Jurnal Serunai Administrasi Pendidikan* (Vol. 10, Issue 2). <https://doi.org/https://doi.org/10.37755/jsap.v10i2.517>
- Sari, A. W., & Wicaksono, V. D. (2022). Pengembangan Media Komik Literasi Islam Berbasis Digital Pada Mata Pelajaran PPKN Materi Nilai-Nilai Pancasila Kelas V Sd Plus Darul Ulum Jombang. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 10(05). <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd>.
- Stidki, A. B., & Pamekasan, A.-M. (2020). Penanaman Karakter Pada Siswa Melalui Kegiatan Intrakurikuler dan Ekstrakurikuler Di Sekolah Dasar Terpadu Islam. *EDUCARE: Journal of Primary Education*, 1(3), 303–322. <https://doi.org/10.21831/jpk.v0i1.8615>
- Sukma, S. A., & Setyasto, N. (2024). Development of E-Comic Learning Media Assisted by Video in Science Learning on Human Blood Circulation Material. *Jurnal Penelitian Pendidikan IPA*, 10(5), 2322–2330. <https://doi.org/10.29303/jppipa.v10i5.7023>
- Toma, A. A., & Reinita, R. (2023). Pengembangan Media Pembelajaran Canva Berbasis Model Problem Based Learning Di Kelas IV Sekolah Dasar. *Sekolah Dasar: Kajian Teori Dan Praktik Pendidikan*, 32(02), 162–177. <https://doi.org/https://doi.org/10.17977/um009v32i22023p162-177>
- Vhalery, R., Setyastanto, A. M., & Leksono, A. W. (2022). Kurikulum Merdeka Belajar Kampus Merdeka: Sebuah Kajian Literatur. *Research and Development Journal of Education*, 8(1), 185. <https://doi.org/10.30998/rdje.v8i1.11718>