

Development of Canva-Based Digital Comic Media for Excretory System Material for Muhammadiyah Middle School Students in Ambon.

Kapraja Sangadji ¹⁾ Zamrin Jamdin ²⁾ Sintia Indah Saputri ³⁾ Adam Jait ⁴⁾

Keywords

Development, Media, Digital Comics, Canva, Excretory System

Abstract

The purpose of this study was to develop a feasible Canva-based digital comic product on the excretory system to improve junior high school students' understanding. This study employed a Research and Development (R&D) method using the ADDIE model, which consists of four stages of analysis: preliminary study, design, development, implementation, and evaluation. Product feasibility testing was conducted using subject matter experts, designers, media experts, and language experts.

The results of the study show that the test results conducted by material experts, design experts, media experts, and language experts indicate that the Canva-based digital comic product developed on the excretory system material to improve students' understanding is very good. These results indicate that the product is suitable for use, with a feasibility score from each, namely Material Experts (100%), Media Experts (82.5%), Design Experts (82%), and Language Experts (80%). Therefore, it can be concluded that the Canva-based digital comic product developed on the excretory system material is convincingly suitable for use and can facilitate students to improve their understanding.

INTRODUCTION

Rapid technological developments play a crucial role in the advancement of organizations and institutions. According to Kapraja (2020), the use of information technology enables more effective, efficient, and systematic decision-making at both the operational and strategic levels. Technology, including computers, is crucial for obtaining accurate and timely information, which significantly contributes to organizational sustainability. In the educational context, information technology supports teaching and learning activities. According to Sugihartini and Yudiana (2018), the success of educational institution management is highly dependent on the availability of reliable information to maintain competitive advantage.

The legal basis for education in Indonesia is regulated in Law No. 20 of 2003. According to the Republic of Indonesia (2003), education is defined as a conscious and planned effort to create a learning process that enables students to develop their potential. Furthermore, according to Okpatrioka (2023), improving the quality of human resources can be achieved through the development of learning processes that adapt to advances in science and technology. In the era of globalization, the educational process is no longer limited to face-to-face meetings in class but can also be carried out online via the internet, allowing flexible interaction and access to digital learning resources anytime and anywhere, as emphasized by Sugihartini and Yudiana (2018).

Learning media, such as digital comics, can facilitate access to information and increase student learning motivation. According to Sukmanasa et al. (2017), digital comic-based learning media helps students better understand learning materials through visual and narrative elements. However, based on observations at Muhammadiyah Junior High School in Ambon, the use of learning media is still limited and lacks diversity. According to Guntur et al. (2023), the dominance of lecture methods in science learning often leads to student boredom and reduced learning interest, especially on abstract topics such as the excretory system.

According to Aulika et al. (2023) and Febriansyah et al. (2022), digital comics are an effective learning medium because they present information through engaging visuals and storylines, are easily accessible across various devices, and offer greater efficiency and flexibility compared to printed textbooks. This study aims to examine the development process and assess the feasibility of this digital comic medium for students at Muhammadiyah Junior High School in Ambon.

METHOD

This study employed a Research and Development (R&D) method aimed at developing a Canva-based digital comic product as a learning medium. According to Okpatrioka (2023), the R&D approach is appropriate for educational research because it focuses on producing innovative learning products that are systematically developed and empirically validated. This method allows researchers to test, revise, and refine educational products to ensure their feasibility and effectiveness.

The ADDIE development model, which consists of five stages: analysis, design, development, implementation, and evaluation, as a basis for developing Canva-based digital comic products.

This research was conducted at Muhammadiyah Middle School Ambon, The research respondents were students. Data collection techniques included observation, interviews, questionnaires, and data analysis techniques. There were two types of data in this study, namely: (1) qualitative data and (2) quantitative data as data analysis techniques.

RESULTS & DISCUSSION

Results

This research aims to produce a media product for students at Muhammadiyah Middle School in Ambon and then develop it into an engaging learning medium to increase student motivation. According to

Okpatrioka (2023), educational research focused on product development aims to produce innovative learning media that can improve student motivation and learning outcomes. The development model used in this study is the ADDIE model, which consists of the stages of Analysis, Design, Development, Implementation, and Evaluation. According to Sugihartini and Yudiana (2018), the ADDIE model provides a systematic and iterative framework for developing learning media, ensuring that the developed product aligns with learning objectives, student needs, and evaluation results.

1. Preliminary Study

According to Azis (2023), a preliminary study helps researchers clarify the research problem, determine the research focus, and develop a more systematic research plan. A preliminary study can involve various methods, such as a literature review, interviews with respondents, and field observations, as emphasized by Maydiantoro (2020).

Field studies show that students' reading interest remains low, and access to engaging and diverse reading materials is limited both at school and at home. According to Marlina and Sholehun (2021), limited reading habits and inadequate learning resources can negatively impact students' motivation and academic achievement. Furthermore, reading activities are not fully integrated into students' daily routines, which consequently impacts learning outcomes at school.

According to Guntur et al. (2023), the dominance of conventional teaching methods and the limited use of innovative media often lead to reduced student engagement and motivation in learning. The fact that teachers have never used digital comics to support the learning process is mainly due to inadequate school infrastructure. However, the use of digital comics at the junior high school level shows significant potential. According to Sukmanasa et al. (2017), digital comics capture students' attention through visual narratives and interactive formats, which can increase student interest and engagement in learning.

2. Development Procedures

1) Analysis Stage

The first stage of this research is the analysis stage. At this stage, a needs analysis, material and curriculum analysis, and learner analysis were conducted to collect relevant data and information for the research. According to Sugiyono (2018), the analysis stage is crucial in research and development because it identifies existing problems, determines learning needs, and provides a basis for developing effective learning media. At this stage, it was discovered that the learning media used by teachers were limited.

According to Pamuji and Hidayati (2020), inadequate and monotonous learning media can hinder students' motivation and understanding, so the development of interactive and interesting learning media, such as digital comics, is necessary to increase interest in learning.

2) Design Stage

In the design stage, learning objectives are formulated simultaneously with product creation. According to Branch (2009), the design stage in the ADDIE model involves determining learning objectives, structuring content, and planning media components to ensure alignment with curriculum objectives:

- a. At this stage, digital learning objectives for science learning are formulated based on Learning Achievements (CP) and Learning Objectives (TP) in accordance with competency indicators set by the curriculum. This ensures that the product is tailored to student needs and the material to be delivered. The learning outcomes implemented follow the Independent Curriculum, while the learning objectives align with the science material on the human excretory system. At this stage, researchers also develop an Independent Learning Plan (RPP) and prepare a post-test specifically designed to evaluate students' understanding of the excretory system (Ministry of Education and Culture, 2020).
- b. Canva-based digital comic creation can present information in an interesting and visual way, thus facilitating student understanding and motivation.

The following are the steps in creating Digital Comic Media:

- 1) Prepare 15 dialogues along with evaluation questions adapted to the excretory system material, which will be included in the comic to guide learning and assess understanding (Nurafrilian, 2021).

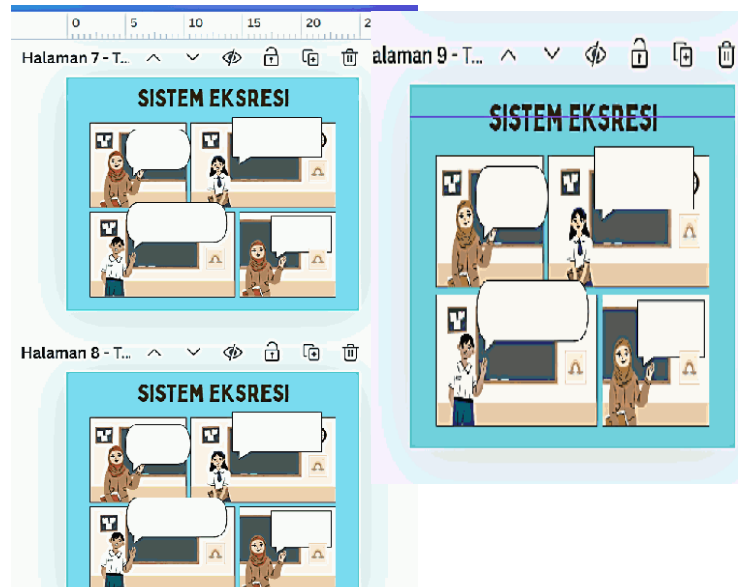


Figure 4.1 Dialog Column.

- 2) Download and install the Canva application on your mobile phone (HP) or laptop as a tool to help you design the most attractive comics possible.

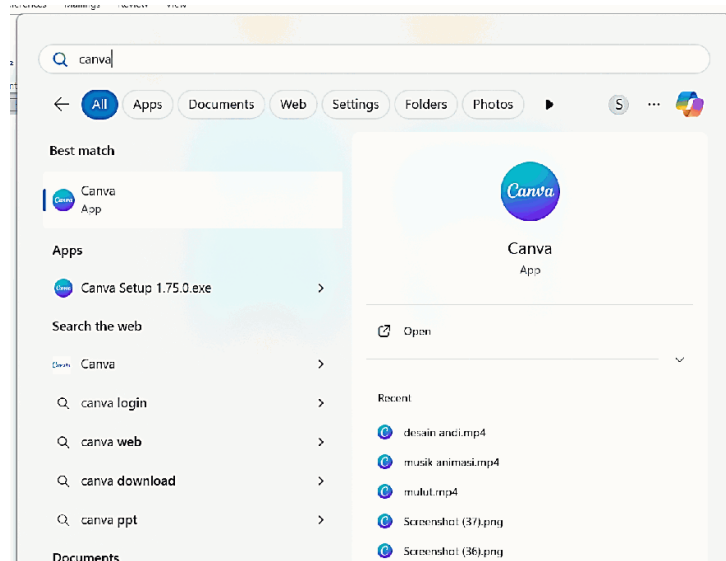


Figure 4.2. Canva application

- 3) Design digital comics with attractive colored backgrounds .

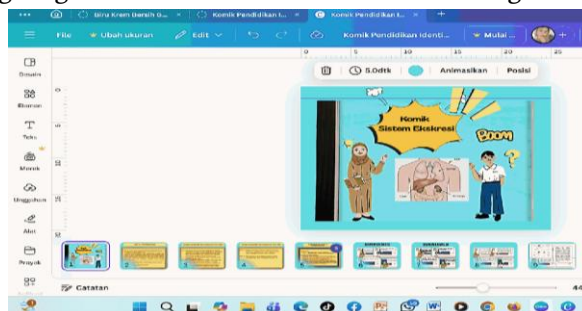


Figure 4.3. Comic Design

- 4) Once the background color is complete, insert the character image and text into the digital comic dialogue box.

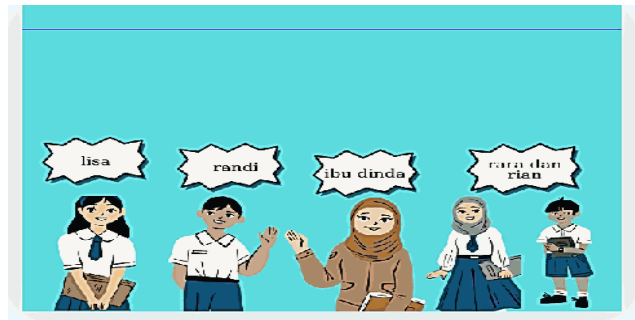


Figure 4.4. Digital Comic Character Figures

- 5) After editing and completing the comic, download the comic file in PDF format.

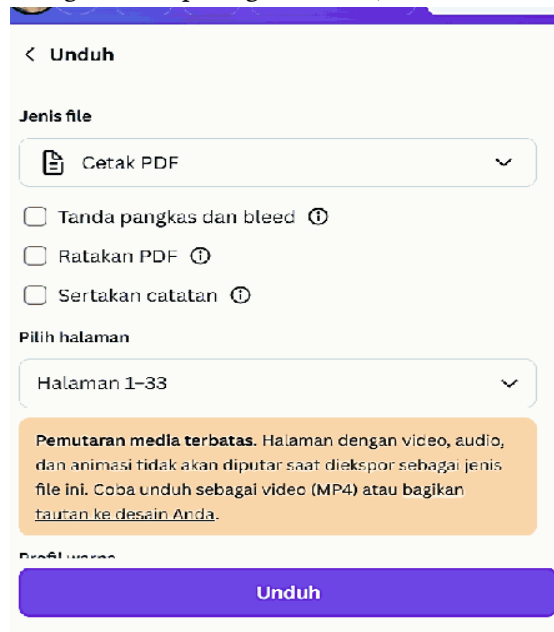


Figure 4.5. Comic file in PDF format

- 6) Then, in the final stage, download it as a link, and your Canva-based digital comic is ready to be developed.

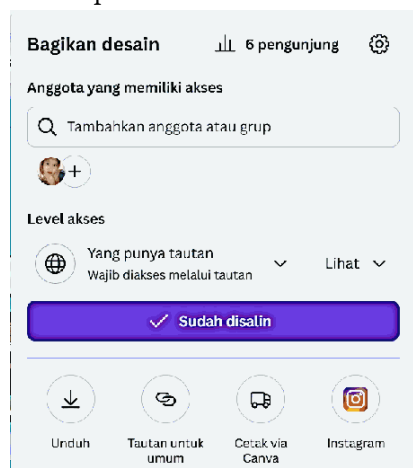


Figure 4.6 Digital comic in link form.

https://www.canva.com/design/DAGoPhl6LXU/vVA1VW0_PjZaKZyN4m-dgO/edit?utm_content=DAGoPhl6LXU&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton

c. Canva application

According to Yuyun Asnawati & Sutiah (2023), the Canva app is an online graphic design application accessible via smartphone or PC that teachers can use to create cost-effective and accessible learning media. According to Huangfu et al. (2021), the integration of artificial intelligence (AI) into the app opens the door to technological innovation and supports continuous progress in education. The Canva app also provides various templates and elements that simplify graphic design creation. In line with this, Kharissidqi & Firmansyah (2022) stated that Canva simplifies graphic design, offers a wide selection of attractive templates, and is user-friendly for all groups. Therefore, Canva can be used effectively to design educational media, including creating digital comics .

3. Development Stage

According to Siregar (2023), the development stage in educational research and development involves the production of learning media based on the design and analysis conducted in the previous stage. At this stage, the product is refined and validated by experts, including aspects such as material, language, design, and media, to ensure its quality and feasibility (Nurafrilian, Sukmanasa, & Suchyadi, 2022). The development process includes preparing all components, validating them, creating test instruments, and conducting assessments to produce a media product suitable for classroom implementation

a. Product Form

According to Yuyun Asnawati & Sutiah (2024), a key aspect in developing digital comic media is ensuring high-quality design, including careful selection of color contrast, character representation, and overall visual appeal. Digital comic media can be created and developed by anyone using easily accessible graphic design applications, such as Canva, which allows for practical and cost-effective media production (Kharissidqi & Firmansyah, 2023). In this study, digital comic media was developed based on the excretory system material for grade VIII and revised through consultation with the supervising lecturer and experts in material, media, language, and design to ensure its validity and suitability for classroom use (Rudiyanto, Huda, & Tobing, 2025) .

c. Validation

According to Azwar (2018), validity refers to how well a test or measurement instrument performs its intended measurement function. Validity can be assessed through various types of evidence, including content-based evidence, response process-based evidence, internal structure-based evidence, relationship-based evidence with other variables, and test consequence-based evidence. In the development of Canva-based digital comic media, validation was carried out by a team of experts, including specialists in materials, design, language, and media, to ensure the product met the required standards and was suitable for classroom use (Rudiyanto, Huda, & Tobing, 2025) :

1) Media Expert Validation

According to Rudiyanto, Huda, & Tobing (2025), media expert validation is conducted to assess the quality of learning media components. In this study, Dr. Acim, M.Pd. evaluated Canva-based digital comic media using a 12-item questionnaire. The assessment results were analyzed using a descriptive percentage technique, with feasibility categories ranging from 0–20% (very unfeasible) to 80–100% (very feasible) .

According to Rudiyanto, Huda, & Tobing (2025), the average score obtained from media expert validation was 82.5%, indicating that Canva-based digital comic media is highly suitable for use as a learning medium. The media underwent several stages of revision based on expert advice, including improving text layout, adjusting backgrounds, color combinations, and incorporating instrumental audio to enhance the learning experience .

2) Material Expert Validation

Based on the results of the analysis of material expert assessment data, it shows that the percentage of Canva-based digital comic media with an average score of 100 % is in the very very feasible category. This means that the Canva-based digital comic media product developed is very feasible to use . According to Aulika et al. (2023) , the assessment confirms that the content of the digital comic is aligned with the curriculum, core competencies, and learning objectives, ensuring that the material is accurate, relevant, and appropriate for learning and very suitable for student use.

3) **Linguist Validation**

The results of the analysis of linguist assessment data indicate that the percentage of Canva-based digital comic media with an average score of 80% in this category indicates that this product is highly suitable. In line with these results, Asri & Dwiningsih (2022) stated that linguist validation showed that the language used in the media is simple, clear, concise, and appropriate for students' intellectual development, making the material easy to understand.

4) **Design Expert Validation**

The validation of the design expert resulted in a "Very Feasible" categorization with an average score of 82% for the product. The evaluation covered aspects such as learning objectives, material presentation, learning methods, and learning evaluation. According to Rudiyanto, Huda, & Tobing (2025), the results show that digital comic media is visually appealing, well-structured, and effectively supports the learning process, increasing student engagement and understanding.

4. **Implementation Results**

According to Sugihartini & Yudiana (2018), implementation in educational research refers to the stage where the developed learning media is tested with students to assess its feasibility and practicality. In this study, Canva-based digital comic media was implemented through a downloadable Canva, allowing students to learn about the excretory system and its disorders in an interactive and accessible manner. The implementation stage also involves preparatory activities, including obtaining school approval, informing teachers about the research objectives, aligning the media with achievement and learning objectives, and preparing student response questionnaires to evaluate the product's effectiveness.

According to Siregar & Siregar (2023), observation is a preliminary activity in research aimed at understanding the conditions, characteristics, and needs of the subjects before implementing learning interventions. In this study, researchers conducted classroom observations to identify the conditions of eighth-grade students and their learning needs related to the excretory system. Prior to the research process, students were introduced to Canva-based digital comic media to ensure they were familiar with the media that would be used during the learning activities.

5. **Evaluation Stage**

According to Sugihartini & Yudiana (2018), the evaluation stage in research and development involves analyzing data obtained from respondents to determine the practicality and effectiveness of the developed product. In this study, the evaluation was conducted using a questionnaire completed by eighth-grade students at SMP Muhammadiyah Ambon to assess the Canva-based digital comic media. Continuous feedback from experts and students ensured that the product met validity and feasibility standards, thus becoming more systematic and effective. The results showed that students demonstrated increased learning motivation and a better understanding of the excretory system after using the digital comic. The student response questionnaire, which covered aspects of content, language, presentation, appearance/design, learning impact, and accessibility, produced scores ranging from 80% to 100%, with an overall average of 89.95%, categorizing the product as highly feasible for learning purposes.

DISCUSSION

1. Level of Need for Digital Comics

According to Anzar & Mardhatillah (in Marlina & Sholehun, 2021), one of the difficulties in learning science is that the material often contains long texts, which can reduce student enthusiasm in class. Although some students find science easy because of its connection to everyday life, many still struggle, as reflected in the generally low end-of-semester evaluation scores. Digital learning media, such as digital comics, are designed to help students master and better understand lessons by presenting content in an engaging and easily accessible format.

In line with this, (Pamuji & Hidayati) stated that Science is one of the subjects tested in the national exam. This makes it a reference point for teachers and schools to pay more attention to Science subjects. Science learning can be successful if teachers can adapt their teaching to students' abilities. During the

learning process, students reported that learning was still dominated by face-to-face sessions and centered on the teacher. To achieve this, attention must be paid to the selection of appropriate strategies, approaches, methods, models, and interactive media.

According to Salsabila (in Anitasari, 2005), research conducted in schools shows that conventional learning methods, such as printed teaching materials, are not optimal in helping students understand lessons and motivating them to learn. Printed teaching materials, although easy to use, have several disadvantages, including high reprinting costs, their large size, difficulty in transporting, and susceptibility to damage over time. As a result, learning delivered using printed media tends to reduce student interest and can cause boredom in the classroom .

According to Salsabila (in Anitasari, 2005), technology plays a crucial role in optimizing learning and facilitating a smoother learning process. With rapid technological advancements, educators are expected to leverage these developments to create innovative, effective, creative, and efficient learning experiences. Although classroom learning increasingly utilizes the internet as a platform for students to access relevant materials, this alone is not enough to increase student motivation or interest in learning. Teachers have also demonstrated the need for online learning media in science teaching, which provided the basis for developing a Canva-based digital comic about the excretory system.

In line with this, teachers stated that they had never used digital comics as a learning medium in science teaching. Across all research subjects, both students and teachers reported enjoying digital comics and felt the need to develop new digital comic learning media.

According to Nurafrilian et al. (2022), the development of digital comic media in learning can facilitate student learning both online and offline. Digital learning media, which produces digital images that can be processed, accessed, and distributed through digital devices, offers an interesting and enjoyable way to improve student understanding. Observing the current reality, the use of electronic media has become a necessity and a strong attraction, especially for children, because it provides a meaningful and enjoyable learning experience that can increase student motivation and interest in the subject matter .

2. Canva-Based Digital Comic Media Design

The next step is to design a digital comic product according to the referenced Learning Plan (RPP). The digital comic was designed using the Canva application. Canva is an easy and simple design application. The Canva application has several advantages, including a variety of attractive design templates, many features provided, practicality, and does not require a long time to create media . The designed digital comic contains text and animated images. The concept of this comic learning is the presentation of images with a sequential storyline. According to Siregar & Siregar (2023), images in comics can clearly convey an event or series of stories without the need for verbal explanations. Thus, when students understand the images they see, they can understand and process ideas and develop their creativity. The background image for each panel is made vivid for students' imagination, and each character is made consistent or unchanged for easy understanding.

3. Level of Validity of Digital Comics

The digital comic media developed, according to plan, was then validated to determine its validity. The product was validated by media experts, material experts, language experts, and design experts. A questionnaire was used to measure the validity of the developed media. The questionnaire used was first validated to assess its suitability in measuring the validity of the digital comic media. In this study, the validity aspects assessed by the material validator were content, language, and presentation aspects. Content validity aims to determine the relevance of the learning media and the subject matter. According to Nurafrilian et al. (2022), content validity refers to the suitability of the comic content to the curriculum, Learning Outcomes (CP), and Learning Objectives (TP). The analysis results showed that the developed digital comic was very feasible.

This digital comic uses simple, easy-to-understand, concise, and clear language, has an unambiguous sentence structure, and uses easy-to-read letter forms and arrangements. The grammar in this book is expected to be accurate and easy to understand by readers, and uses simple terminology or terms that are easy to understand. Furthermore, the formulated learning objectives are clear, precise, and in accordance

with what students are expected to achieve after studying the digital comic. According to Arsyah (in Asri & Dwiningsih, 2022), learning media must focus on the learning objectives to be achieved after the learning is completed. In line with this, Siagian & Yasthophi (in Asri & Dwiningsih, 2022) stated that learning media must be aligned with basic competencies and learning objectives to make learning more meaningful.

Then, for design, such as graphics; appropriate font type and size, selection of attractive color combinations for students, balanced image layout with frame shape, image design, and ease of access to digital comic media. In line with this, Mumpuni in Asri & Dwiningsih, (2022) stated that the color and background combinations used are designed to be comfortable and easy to read, thus creating an attractive appearance that influences students' reading interest.

CONCLUSION

Based on the results of research and discussion on product development and evaluation of Canva-based digital comic media, the following conclusions can be drawn:

1. Based digital comic learning media for excretory system material in science subjects, as a development product that begins with preliminary research through a development process carried out through several stages of analysis, planning, development, implementation and evaluation.
2. The results of expert evaluations of the Canva-based digital comic products developed show their feasibility and effectiveness in facilitating students in learning activities in science subjects, especially in the excretory system material.

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