

Canva-Based Animation Comic Video Media in Informatics Learning

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Abstract: This study aims to develop Canva-based animated comic video learning media that are valid, practical, and effective for Informatics in Grade VIII at SMP N 14 Padang. The research adopts a Research and Development (R&D) approach, applying the 4D model – Define, Design, Develop, and Disseminate. Primary data were collected from validators, teachers, and students, with descriptive and inferential analysis used to evaluate media validity, practicality, and effectiveness. Results show the media to be valid, scoring 0.963 for media and 0.975 for material aspects. The media is also highly practical, with teacher ratings at 97.04% and student ratings at 93.14%. Effectiveness is indicated by a Gain Score of 0.69 (medium category) and a significant improvement in student learning outcomes, as confirmed by t-test results (Sig. 2-tailed = 0.000; tcount > ttable). The findings confirm that Canva-based animated comic videos significantly enhance student learning outcomes over conventional methods.

Keywords: Animated comic video; Canva; Learning media; Informatics

Introduction

Education today in Indonesia is not only considered as a public service provider, but also as a productive investment that supports growth in various fields and development sectors. Education is not only an indicator of a nation's progress, but also plays an important role in determining a country's progress. The concept of "Freedom to Learn" emphasizes innovation and change as the core, aiming to create students with skills such as critical thinking, creativity, innovation, as well as communication and collaboration skills that are important in the era of the industrial revolution 4.0. According to Muzakki (2021) teachers should not treat students uniformly, but should guide them according to individual talents and interests, similar to planting rice which cannot be expected to become corn. This means that the learning environment must allow students to feel valued and have freedom in the learning process. However, many teachers currently do not adequately consider students' uniqueness, which causes boredom,

lack of productivity, and less than optimal learning independence. They often focus too much on delivering the material without paying adequate attention to students' actual achievements and outcomes.

Rahmadayanti & Hartoyo (2022) states that the Merdeka Belajar curriculum emphasizes results and project-oriented learning, with a focus on the Pancasila student profile and basic competencies such as literacy and numeracy. Teachers need to adopt various media in the Independent Curriculum to make learning more interesting for students. Research shows that the use of video-based teaching materials is practical and effective as a learning resource in the learning process (Fadilah et al., 2023; Wulandari et al., 2023).

The use of animated video-based learning media, especially those developed with the Canva application, has proven effective in increasing student motivation and learning participation. Research shows that this media has a high level of validity and gets a positive response from students in terms of satisfaction with learning (Xian et al., 2022; (Hapsari & Zulherman, 2021;

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Lestari & Agustika, 2020); Utri et al., 2022). Assessment of student learning achievements in the Informatics subject at SMP Negeri 14 Padang shows that the majority of students have not achieved the expected learning completeness. Of the total 64 students from classes VIII.3 and VIII.7, 46 students require remediation in various aspects of learning. Observations also reveal that the use of conventional learning media such as blackboards and teaching modules is still dominant, lacking the variety needed to motivate students. This results in a lack of interest in learning and limited access to innovative learning materials, especially for students with an audiovisual learning style.

As a solution, the use of Canva-based animated comic media is recommended to overcome this challenge. This is expected to increase the interactivity, visualization and attractiveness of learning as well as provide better support for students' individual learning needs. Using the Canva platform also makes it easier for teachers to create interesting content that suits learning needs. Thus, the transition to Canva-based animated comic media not only brings variety in learning approaches, but also optimizes teaching potential through a medium that is innovative and accessible to all students.

This research identifies several challenges in education, such as a lack of variety in learning approaches which causes monotony and lack of stimulation of student interest, as well as limitations in learning formats that focus too much on written reading. The focus of the research is to develop learning media in the form of animated comic videos for class VIII Informatics subjects at SMP Negeri 14 Padang, with the aim of increasing learning interactivity and supporting student understanding. The problem formulation includes how to produce, evaluate the validity, practicality and effectiveness of this media, as well as its implementation in schools. The aim of the research is to improve students' understanding of Informatics material with this innovative media. The benefits include increased theoretical understanding of learning media and practical benefits for teachers and students. Product specifications include the development of flexible Canva-based animated comic videos accessed via the internet, focusing on computer systems and hardware. The assumptions and limitations of the study include one particular class and subject, as well as reliance on internet infrastructure and students' basic knowledge of computers. Operational definitions of these terms were used as the basis for the research methodology and results.

Learning is a process in which students experience change through interaction with their environment (Festiawan, 2020; Suardi et al., 2018). This involves

stimulus, guidance, and encouragement to achieve learning goals (Anggraeni, 2019; Nugraha, 2018). Learning is not only about changing behavior but also developing potential and interacting with the environment to improve individual knowledge and quality (Agustina, 2018; Oktiani, 2017). Technology education focuses on solving problems with technology, while vocational education focuses on practical skills. Integration of the two, or vocational technology education, increases effectiveness. TVET includes continuing education that prepares individuals with job skills. Vocational education prepares individuals for the world of work with productive skills and attitudes.

Informatics education in schools includes understanding information technology, computer programming, networks, databases, and information security. Computational thinking is emphasized to develop analytical and problem solving skills. The curriculum begins with a basic introduction to computers and the internet in elementary school, then leads to the development of advanced programming skills and software development in high school. Critical digital and collaboration skills are also taught to prepare students for the ever-evolving world of technology.

The use of learning media in the teaching and learning process has a large positive impact. Media not only arouses students' interest and motivation, but also increases the interaction between teachers and students, learning efficiency, and uniform experience of the surrounding environment. The benefits include improvements in the presentation of information, increasing student attention, overcoming sensory and spatial limitations, and providing direct experience through activities such as visits to museums or zoos.

Comics are a form of presenting stories with funny pictures that are simple and easy to understand, popular among children and adults (Meliana et al., 2020; Widyastuti et al., 2022). Ade (2022) emphasizes that comics also act as a medium for developing children's personalities and as a means of communication that can convey stories, messages and scientific content. Harits (2021); Nurrita (2018) comics are a form of cartoon that depicts characters and acts out stories with a close sequence of images. Comics are divided into commercial comics, which entertain with humor, and educational comics, which focus on informative content (Jannah et al., 2024; Nafala, 2022).

Animation is the process of creating the illusion of movement through a series of images arranged sequentially. Types of animation include still image animation (stop-motion), traditional animation, and computer animation (3D). Animation can be classified based on its creation technique, such as cel animation, frame animation, sprite animation, path animation,

spline animation, vector animation, and character animation. This classification reflects the development of animation technology and the complexity of creating interesting visual works.

Canva is a popular graphic design platform, providing a variety of features such as ready-to-use templates, comprehensive design tools, a user-friendly editor, as well as cloud storage for team collaboration. Even though it has advantages such as integration with other platforms, a collection of stock images and videos, and animation features (Canva Pro), Canva also has several disadvantages, such as limited functionality in the free version, less suitable for complex designs, and the risk of design uniformity due to the use of templates. The same. Nevertheless, Canva is very useful in education for creating creative and efficient learning media materials.

Method

This research adopts the type of research and development (R&D) to create specific products and test their effectiveness, as explained by Sugiyono (2019). The development model chosen is the four-D model (Define, Design, Develop, and Disseminate), which is structured systematically and in accordance with the research background problem. The main aim of implementing the four-D model is to develop valid, practical and effective learning media in increasing students' interest in learning.

Table 1. Material expert validity assessment instrument grid

Aspect	Indicator	Item Number
Material Quality	Completeness of material in the media	1-3
	Systematic preparation of material	4-5
	The language used in writing the material	6-7
Learning Quality	Suitability to learning objectives	8-9
	Increased learning motivation	10-11
Quality of Interaction	Increased learning independence	12
	Text is easy to read	13-14
Display Quality	Instructions and description	15-17
	Use of animation	18
Quality	Use of color and navigation buttons	19-24
	Use of music (<i>sound</i>)	25

The subject of this research is the development of animated comic video-based learning media for informatics subjects, especially computer system elements and computer hardware material in class VIII.

The population consists of eight classes (VIII.1 to VIII.8), with sample selection using the Cluster Random Sampling method. The experimental class chosen was VIII.3, totaling 32 people, and the control class was VIII.7, totaling 32 people. This research will focus on these two classes to evaluate the effectiveness of the learning media developed.

Before being tested on students, the product was evaluated by two material experts from SMP N 14 Padang teachers and two media experts from UNP engineering department lecturers. The instruments can be seen in Table 1 and Table 2.

Table 2. Grid of media expert validity assessment instruments.

Aspect	Indicator	Item Number
Visual	Text dimensions	1-3
	Choice of writing color	4-6
	Visual and image quality	7-8
	Image and content layout	9-10
Media Design	Ease of use of media	11-13
	Effectiveness of media navigation	14-15
Media Utilization	The usefulness of media in learning	16-20

Next, a practicality questionnaire was used which included perceptions and suggestions from teachers and students. The questionnaire aims to assess the practicability of the animated comic video-based learning media that has been developed. The instruments can be seen in Table 3 and Table 4.

Table 3. Practicality assessment instrument grid for teachers

Aspect	Indicator	Item Number
Ease of Use	Use in Operation	1-2
	Use in independent learning in students	3
	Understanding on material	4-6
Effectiveness of Learning Time	Preparation for use	7-8
	Utilization in the learning process	9-10
Media Use	Ease of use in the learning process	11-12
	Interest in media use	13-14

Table 4. Grid of practicality assessment instruments for students.

Aspect	Indicator	Item Number
Ease of Use	Use in Operation	1-2
	Understanding on material	3-4
Effectiveness of Learning Time	Use in understanding the material	5
	Utilization in the learning process	6-8
Media Use	Interest in media use	9-10
	Ease of use in the learning process	11-12
	Increasing student interest in learning and learning independence	13-14

The technique used to analyze data is qualitative descriptive analysis. Analysis of learning media techniques is carried out to assess whether the data resulting from the validation of the learning media that has been created can be considered to be continued to the next stage or not. and Practicality of a media is used to measure how practical the learning media that has been created is. The assessment in the questionnaire uses a Likert scale with five answer options, namely SS, S, R, KS, and TS.

Furthermore, to determine the increase in student learning outcomes, which is measured by the difference between pretest results and posttest results, Gain Score is used. Effectiveness testing can use the following N Gain (gain score).

The pretest and posttest scores will be used as indicators of the level of effectiveness in learning which is usually called the Gain score. To see the interpretation of the gain score, see Table 5

Table 5. Gain score interpretation

Gain score	Interpretation
$(<g> \geq 0.7$	Tall
$0.7 > (<g> \geq 0.3$	Currently
$(<g> < 0.3$	Low

Source: Sulistiyono (2022)

Meanwhile, the comparison of differences in learning outcomes for the Control Class and Experimental Class is seen based on effectiveness using the normality test, homogeneity test and T test. If the Sig value is ≥ 0.05 , then the data is considered to be normally distributed. Conversely, if the Sig value is < 0.05 , the data is considered not normally distributed. and If the Sig value ≥ 0.05 , then the data is considered homogeneous. Conversely, if the Sig value is < 0.05 , the data is considered not homogeneous. Furthermore, if Sig. (2-tailed) with research alpha (0.05), namely: if the

significance value or Sig. (2-tailed) < 0.05 then H_0 is rejected and H_a is accepted; if the significance value or Sig. (2-tailed) > 0.05 then H_0 is accepted and H_a is rejected.

Result and Discussion

Results

Validity of Learning Media

Making animated comic videos based on Canva with the following steps: Open the application using the website <http://canva.com/>. Then type "Comic Strip" in the search field. You can also directly access the following page <https://www.canva.com/create/comic-strips/>.

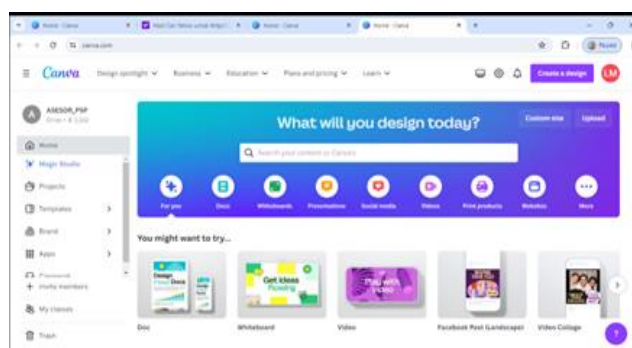


Figure 1. Canva homepage.

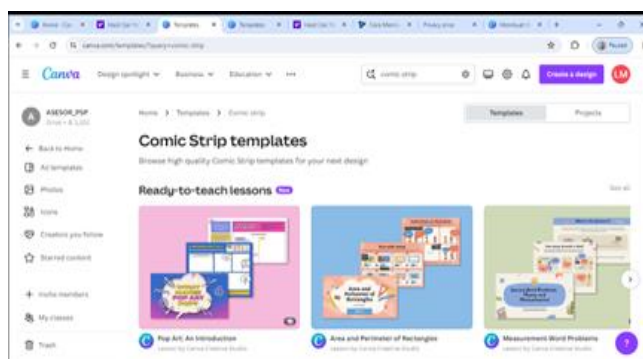


Figure 2. Comic Strip

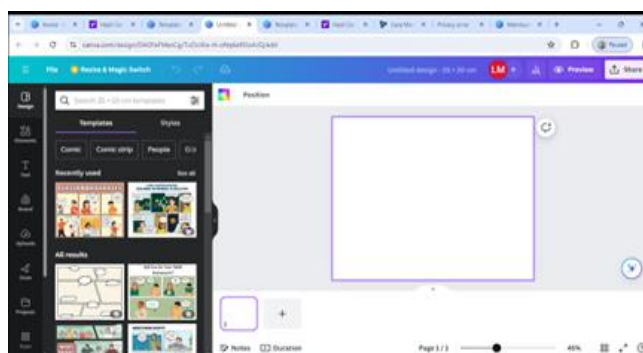


Figure 3. Selecting a Template.

Next, create a comic using a blank page or by using one of Canva's ready-made templates. Look for a suitable template and edit the template so that it turns into a comic as expected. After the comic is finished, download it in PPT format.

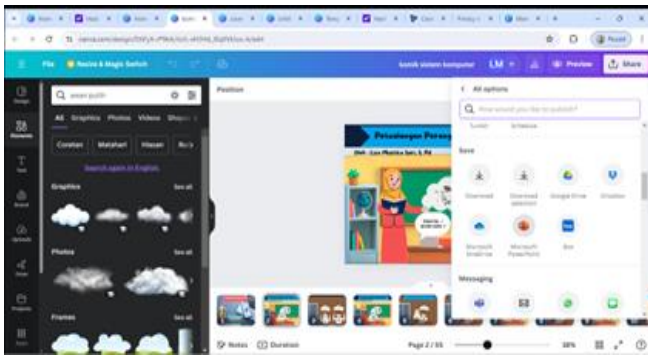


Figure 4. download comic videos

Next, give voice to the comic characters using the Voice Maker application. Select the voice character by clicking change, and then convert to speech. Then open Power Point, and input the audio by clicking *Insert*.

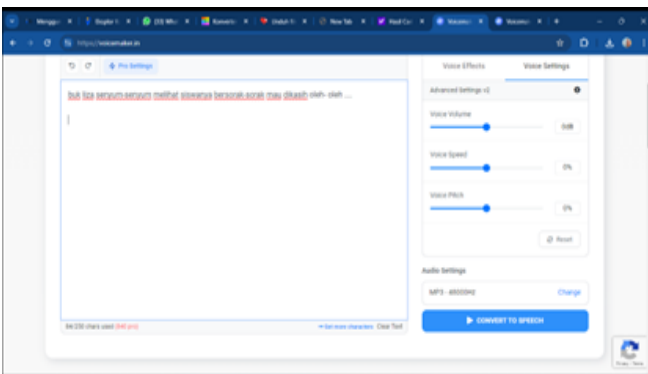


Figure 5. Use of Voice Maker for voice characters



Figure 6. Inputting Voice Characters into Powerpoint

After giving the character voice, then make a video by clicking file and export, click create a video and click create video

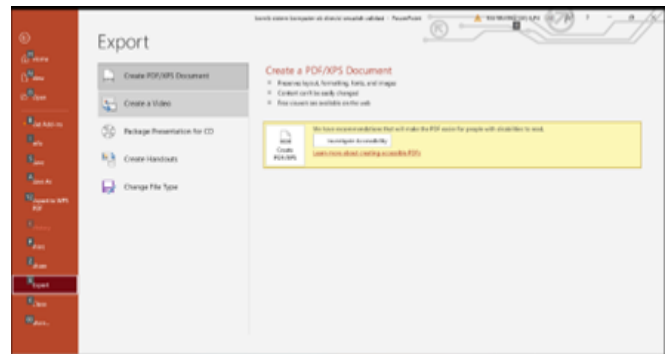


Figure 7. Exporting PPT into video format

The results of the design of the learning media display via the Google Sites learning e-learning website consist of: The Home menu is the main display where the menus are for Canva-based animated comic video learning media

Next, click the HOME logo and you will enter the computer system elements menu collection. The Computer System element display contains a home button to return to the home page, then there is a profile button, module button, video button, evaluation button and reflection button



Figure 8. Computer System Menu

The profile page displays the profile of the animated comic video media developer. In this profile menu there is a home button to return to the Computer System Elements menu page.

This page contains Figure 9, the Computer System Elements Module, the first meeting on computer generation development material, the second meeting on computer hardware, the third meeting on computer software, the fourth meeting on computer branware, the fifth meeting on number systems, the sixth meeting on embedded systems, the seventh meeting on logic gates, and the eighth meeting on systems operation. The

module can be opened in PDF file format. Home button to return to the Computer System Elements menu page.



Figure 9. Developer Profile



Figure 10. Module Menu

On the video menu page, media users can select several material elements in the Informatics subject in the form of animated comic videos. Next, go to the home menu to return to the Computer System Elements menu.

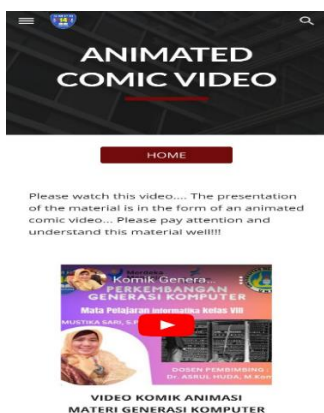


Figure 11. Video menu

Evaluation is presented in the form of a free-test and post-test to test learning achievements in the

commuter system elements in informatics subjects. This free test and post-test are made in the form of a quiz using the quizizz application



Figure 12. Evaluation

In the Reflection menu there is a Learning Reflection using the Google Form application. Users can click on the reflection link after studying the material, for example Computer Hardware material.

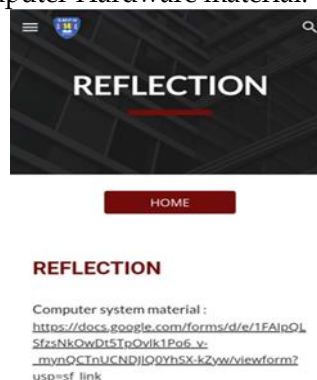


Figure 13. Reflection

Based on assessments from media and material experts, validation tests are used to determine whether the learning media that has been created is appropriate. Validators who are experts in the field of media and materials fill out the instrument to determine the results of the validity assessment. The research findings show the feasibility of the learning media developed. The table below displays an overview of validation findings

from media specialists on several aspects of learning media.

Table 6. Media Expert Validation Results

Number	Assessment Aspects	Average Validator Value	Category
1	Visual	0.988	Valid
2	Media Design	0.925	Valid
3	Media Utilization	0.975	Valid
Average		0.963	Valid

The results of this validation show that the media is considered valid in the visual aspect with a value of 0.988 (≥ 0.667), as well as in the media design aspect with a value of 0.925 (≥ 0.667). Apart from that, in the aspect of media utilization, this media is considered valid with a value of 0.975 (≥ 0.667). All assessments of media validation aspects are included in the valid category. Apart from that, the average validity value in media validation is 0.963 (≥ 0.667), which is also included in the valid category.

Material experts validate several aspects such as material quality, learning quality, interaction and appearance. Validators evaluate the material presented in this Canva-based animated comic video learning media and provide an assessment. The assessment of each aspect is analyzed using the Aiken's V statistical formula. The results of this analysis produce a validation value for the product that has been designed. Validation recapitulation is compiled from evaluation of material aspects in learning media, as listed in Table 7.

Table 7. Material Validation Results

Assessment Aspects	Validation Value	Category
Material Quality	0.964	Valid
Quality of learning	1.000	Valid
Quality of Interaction	1.000	Valid
Display Quality	0.938	Valid
Average	0.975	Valid

This validation shows that the media is considered valid in terms of material quality with a value of 0.964 (≥ 0.667), learning quality with a value of 1.000 (≥ 0.667), interaction quality with a value of 1.000 (≥ 0.667), and display quality with a value of 0.938 (≥ 0.667). All aspects of the validation of this material fall into the valid category. Apart from that, the average validity value in material validation is 0.975 (≥ 0.667), which is also included in the valid category.

Furthermore, the results of the practicality test are based on the teacher's response to the Canva-based animated comic video learning media that has been developed. These practicality results show that the media is considered very practical in terms of ease of use with a value of 97.78%, effectiveness of learning time with a value of 96.67%, and use of the media with a value of 96.67%. Evaluation of every aspect of the practicality of the teacher's response falls into the very practical category. The average practicality score from the teacher response questionnaire was 97.04%, which is also included in the very practical category. Thus, based on the teacher's response to the media developed, this media can be categorized as very practical. The results of the teacher response questionnaire data are shown in Table 8.

Table 8. Results of Teacher Practicality

Indicator	Percentage %	Criteria
Ease of Use Aspect	97.78	Very Practical
Aspects of Effectiveness of Learning Time	96.67	Very Practical
Aspects of Media Use	96.67	Very Practical
Average Percentage (%)	97.04	Very Practical

Canva-based animated comic video learning media that has been developed. This media is considered very practical in terms of ease of use with a score of 94.06%, effectiveness of learning time with a score of 92.97%, and use of the media with a score of 92.40%. The evaluation of each aspect of the practicality of the student's response falls into the very practical category. The average practicality score from the student response questionnaire was 93.14%, which is also included in the very practical category. Thus, based on students' responses to the media developed, this media can be categorized as very practical. The results of data processing can be seen in Table 9.

Table 9. Student Practicality Results

Percentage %	Criteria
94.06	Very Practical
92.97	Very Practical
92.40	Very Practical
93.14	Very Practical

The results of this research are consistent with the findings of Hapsari (2021), which shows that the media developed is effective with a gain score of 0.56, which is included in the medium category. Apart from that, the research revealed that there was a significant influence on the learning outcomes of students who used this media compared to those who did not use it, with a pretest-posttest significance value of 0.000 < 0.05 . This indicates that the media developed has a significant impact in improving student learning outcomes, so it is very effective for use in learning. Other research also shows similar results, where in hypothesis testing using the independent sample t-test, the two-tailed significance value was 0.000 < 0.05 . Thus, based on the results of the independent one sample t-test, it can be concluded that H0 is rejected and H1 is accepted. In conclusion, the use of digital video comic media is effective in increasing students' interest in learning and their learning outcomes.

Discussion

Based on research into the development of Canva-based animated comic video learning media, several important things can be concluded. First, through the stages of analysis to testing, interesting, interactive and innovative learning media have been successfully

developed for the Informatics subject at SMP N 14 Padang. This media, which can be downloaded by teachers and students, offers flexibility of access thereby supporting independent learning and increasing student learning motivation (Amikratunnisyah & Santosa, 2022; Danaswari et al., 2013). Second, validation results from experts show that this media is very suitable for use in learning, with an average validity value of 0.963 from media experts and 0.975 from material experts. Third, this learning media has proven to be very practical, based on positive responses from teachers with a practicality score of 97.04% and from students of 93.14%. Fourth, the effectiveness of this learning media is supported by the results of the gain score and t test (independent sample T-test). The average posttest gain score value for the experimental class was 0.69 in the medium category, while the t test showed a significant value (Sig. (2-tailed) $0.000 < 0.05$) and the tcount value of 7.686 was greater than ttable (1.99897). This indicates that there is a significant difference between the learning outcomes of control group and experimental group students, confirming that the use of Canva-based animated comic video learning media is effective in improving student learning outcomes (Alamia et al., 2024; Pulungan et al., 2024; Sumunik et al., 2023).

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Conflicts of Interest

The researchers declare there is no conflict of interest.

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