

Comic Video Learning Media in Science Content: Nature of Objects and Their Changes

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ARTICLE INFO

Article history:

Received July 13, 2023

Revised July 18, 2023

Accepted November 30, 2023

Available online December 25, 2023

Kata Kunci:

Hasil Belajar IPA,
Video Komik, Pengembangan

Keywords:

Science Learning Outcomes,
Comics videos, Development



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ABSTRAK

Belum adanya media pembelajaran yang inovatif mengakibatkan hasil belajar IPA siswa tidak tercapai secara maksimal. Penelitian ini bertujuan untuk menghasilkan desain dan menguji validitas, praktikalitas, dan efektivitas media pembelajaran video komik. Penelitian ini menggunakan model pengembangan ADDIE. Subyek penelitian ini adalah 2 orang ahli, 1 orang praktisi, dan 1 kelompok siswa kelas V SD. Sedangkan objek penelitiannya adalah media pembelajaran video komik pada konten IPA, materi tentang sifat-sifat benda dan perubahannya. Metode pengumpulan data yang digunakan adalah angket untuk mengukur validitas dan praktikalitas media yang dikembangkan dan soal pilihan ganda untuk mengukur hasil belajar IPA siswa. Teknik analisis data yang digunakan adalah analisis kualitatif dan analisis kuantitatif. Hasil penelitian menunjukkan bahwa menghasilkan produk berupa media pembelajaran video komik pada materi muatan IPA tentang sifat benda dan perubahannya, media pembelajaran video lucu tersebut memperoleh validitas sangat baik dengan tingkat ketercapaian 90% oleh ahli materi. dan 93,33% dari ahli media, mencapai tingkat kepraktisan. Respon praktisi sebesar 96,67%, tes individu sebesar 97,5%, dan tes kelompok kecil sebesar 98,75%. Disimpulkan bahwa media pembelajaran video komik efektif meningkatkan hasil belajar IPA siswa. Penelitian ini berimplikasi pada minat belajar siswa dan peningkatan kualitas pembelajaran.

ABSTRACT

The absence of innovative learning media has resulted in students' science learning outcomes not being achieved optimally. This research aims to produce a design and test the validity, practicality, and effectiveness of comic video learning media. This research uses the ADDIE development model. The subjects of this research were 2 experts, 1 practitioner, and 1 group of fifth-grade elementary school students. In contrast, the research object was comic video learning media on science content, material about the properties of things and their changes. The data collection methods used are questionnaires to measure the validity and practicality of the media developed and multiple choice questions to measure students' science learning outcomes. The data analysis techniques used are qualitative analysis and quantitative analysis. The results of this research show that producing a product in the form of comic video learning media on science content material about the nature of objects and their changes, the amusing video learning media obtained very good validity with an achievement level of 90% by material experts and 93.33% from media experts, achieving a level of practicality. Amounted to 96.67% by practitioner responses, 97.5% by students in individual tests, and 98.75% by small group tests. It was concluded that comic video learning media effectively improved students' science learning outcomes. This research has implications for students' interest in learning and increasing the quality of lessons.

1. INTRODUCTION

Education is the main aspect in human self-development and as a bridge to improve knowledge, thereby creating quality education (Miasari et al., 2022; Sari & Ganing, 2021). In the world of education today there is a demand for the development of learning approaches in accordance with the existing education in our country. Education is always at the center of everyone's attention. Currently, challenges in the world of education will continue to be adjusted to science and technology standards (Sole & Anggraeni, 2018; Wisman et al., 2021). The existence of technology can develop education, another goal is that technology can help students overcome problems in the learning process (Widianto, 2021; Zahwa & Syafi'i,

2022). The increasingly concentrated development of science and technology in the current era will have a positive impact on learning, so that the creation of learning media can be combined with technology. With the rapid development of technology, it is necessary to adapt to the demands of the times. Modern education is ways of learning that are in line with the demands of the times, which are carried out to prepare participants to follow the current of developments. Learning activities in the modern era like today not only teach students to be able to understand various fields of science but also teach students to be able to think critically, systematically, and be able to solve various existing problems (Mustofa & Riyanti, 2019; Pratiwi et al., 2019).

The main activity carried out in education is learning. Learning is an effort made to experience relatively permanent changes in behavior due to individual interactions with their environment (Maâ, 2018). One of the subjects studied is science. Science is a science related to finding out about natural phenomena systematically, so that science is not only mastery of a collection of knowledge in the form of facts, concepts or principles, but is also a process of discovery (Handayani, 2018; Iskandar & Kusmayanti, 2018). Elementary school is the first formal place to receive science lessons so it needs to instill strong concepts (Ichsan et al., 2018; Jundu, Tuwa, et al., 2020; Portanata et al., 2017). Science learning activities in elementary schools need to be expanded in scope so that they provide experience in studying the natural surroundings (State et al., 2021; Widura et al., 2021). This is in line with the aim of implementing science learning, namely to increase awareness of participating in maintaining, guarding and conserving the natural environment and aims to develop process skills for investigating the natural surroundings, solving problems and making decisions (Atminingsih et al., 2019; Safrida & Kistian, 2020).

Low student interest in learning can have an impact on decreasing student learning outcomes. Learning requires media that attracts students' interest in learning because in teaching and learning activities there needs to be student motivation in carrying out the learning process in order to be able to achieve the educational goals you want to achieve (Agustiana et al., 2021; Dewi et al., 2021). To maximize science learning in elementary schools, teachers should implement innovative learning, so that students get maximum learning results. In the science learning process, teachers should give students the freedom to be active in exploring their own information, solving problems on their own, in other words, in the learning process, teachers guide students on the right path so that students do not misunderstand and learning is not teacher-centered (Muliani & Wibawa, 2019; Sappe et al., 2018). Apart from that, teachers must also provide relevant learning resources to create quality learning, one of which is by utilizing learning media. The ineffectiveness of the learning process can be overcome by using learning media (Widiyanto et al., 2021). A teacher's success in the science learning process can be said to be successful if the teacher is able to change learning that was previously difficult to become easy, which was not interesting to become interesting, which was previously meaningless to become meaningful for students. Learning media is one of the most important things that teachers use in teaching and learning activities at school. In teaching and learning activities, learning media is needed to convey material to students so that learning media needs to be used optimally.

However, the reality in the field shows that not all teachers are able to apply learning media in every learning process. This is in line with the results of observations and interviews conducted at SD Negeri 3 Tamanbali. The results of observations show that the use of learning media has not been carried out optimally. Apart from that, data was obtained from class V teachers that there were 54.5% who obtained mid-semester grades below the KKM (Minimum Completeness Criteria), namely 5 out of 11 students. These learning results show that some students have obtained good learning results, but there are still students who have not obtained maximum learning results if seen from the KKM set by the school, namely the KKM in Science is 76. From distributing questionnaires to students, the results showed that students in class V of elementary school Negeri 3 Tamanbali likes to learn while watching a video given by the teacher so the teacher wants to use comic video learning media. Apart from that, this media is used to make it easier for teachers to convey lesson material to students because the coverage of science material in elementary schools is limited. Teachers at SD Negeri 3 Tamanbali are still less innovative in developing learning media, so changes or innovations in the use of learning media are needed. One learning media innovation that can be developed to attract students' interest in learning according to students' preferences, namely liking cartoons, is comic video learning media. This is supported by the distribution of questionnaires given to teachers and students of class V SD Negeri 3 Tamanbali that the learning media of video comics has never been used in learning and science material can be developed into video comics.

Comic media is basically a media for pictorial stories that are conveyed through an image containing all the figures or characters in it. Comics are also said to be a form of visual communication that is used to convey information to readers (Riwanto & Wulandari, 2018; Widiyanto et al., 2021). In the development of comic media, it can be presented digitally, as well as in video form, where comic videos are illustrated stories conveyed via audio-visual containing cartoon characters with dubbing for each character

and containing accompanying music, in other words, comics that are made into a video (Rosyida, 2019; Widiyanto et al., 2021). Comic videos have the advantage of increasing students' enthusiasm, interest and enthusiasm for learning and making it easier for students to understand the material. Apart from that, comic videos can also increase children's vocabulary because children can learn while listening, listening and reading. This comic video learning media can also be used in various places, even outside of school, comic videos can still be used by students to learn.

Several previous studies have revealed that the application of comic learning media can improve student learning outcomes (Rosyida, 2019). The results of other research reveal that digital comic media based on a scientific approach to science content is in the very valid category and is suitable for use in the learning process (Ayu et al., 2021). The results of further research reveal that digital comic media can help improve learning outcomes in material on Pancasila values for fourth grade elementary school students (Fitri et al., 2023). Based on several research results, it can be said that comic media can significantly improve student learning outcomes. It's just that in previous research, there have been no studies that specifically discuss the development of comic video learning media on science content regarding the nature of objects and their changes. So this research is focused on this study with the aim of producing comic video media designs for science subjects on the nature of objects and their changes as well as producing comic video media for science subjects on the nature of objects and their changes that are valid, practical and effective on students' science learning outcomes of class V.

2. METHOD

This research uses a development research or R&D (Research and Development) model. The research model used in this development research is the ADDIE model. The ADDIE model consists of five stages, namely the analysis stage, design stage, development stage, implementation stage and evaluation stage (Dwiqi et al., 2020; Sholeh, 2019). The ADDIE model is a systematic development research model, where the sequence of activities refers to efforts to solve student learning problems and is based on the theoretical basis of learning, and the steps in this model are coherent and simple to produce products that can be implemented in learning (Kuncahyono, 2018). The development of comic video learning media was carried out through several stages in the ADDIE model. The first is the analysis stage, the stage of analyzing needs, the second is the design stage, is the stage of the media design process that will be developed, the third is the development stage, is the stage of developing media that has been previously designed, the fourth is the implementation stage, is the stage of implementing media in the learning process, and the final stage is Evaluation is a stage to provide value to the media that has been developed.

The subjects of this research were 2 experts, 1 practitioner, and 1 group of class V students, while the object of the research was comic video learning media on science content, the nature of objects and their changes. The types of data used in this research are quantitative data and qualitative data. Quantitative data from this research was obtained based on scores obtained after expert tests or figures obtained from assessments by experts, practitioners, students from individual, small group and field tests. Meanwhile, the qualitative data from this research was obtained from comments, criticism and suggestions from expert reviews. Data collection in this study used a questionnaire to measure validity and practicality and multiple choice questions were used to measure student learning outcomes. The instrument grid used in this research is presented in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. The Grid of Material Expert Comic Video Media Validation Sheet

No.	Aspect	Indicator	Item Number	Number of Items
1.	Material/Content	Completeness and clarity in conveying identity	1, 2	2
		Delivery of learning objectives is clear	3	1
		Presentation of material clearly	4, 5, 6, 7, 8	5
2.	Language/Communication	Appropriate use of language rules	9, 10, 11	3
		Use language that is easy for students to understand	12	1
3.	Presentation	Mismatch in presentation	13, 14	2
		Integration in presentation	15	1

Table 2. The Media Validation Sheet Grid Video Comic Media Expert

No.	Aspect	Indicator	Item Number	Number of Items
1.	Voice and text	The text is presented clearly	1, 2	2
		Sound is presented clearly	3, 4	2
2.	Visual	Illustrations are presented clearly	5, 6	2
		Attractive background display	7, 8	2
		Combination in the use of colour	9, 10	2
3.	Characterization	Character selection	11, 12	2
		The attractiveness of the characters	13	1
4.	Overall View	Display integration	14, 15	2

Table 3. The Grid of Validity and Response Sheet for Comic Video Media for Practitioners

No.	Aspect	Indicator	Item Number	Number of Items
1.	Material/Content	Completeness in conveying identity	1, 2	2
		Delivery of learning objectives is clear	3	1
		Presentation of material clearly	4, 5, 6, 7, 8	5
2.	Language/Communication	Appropriate use of language rules	9, 10, 11	3
		Use language that is easy for students to understand	12	1
3.	Presentation	Mismatch in presentation	13, 14	2
		Integration in presentation	15	1
4.	Voice and text	The text is presented clearly	16, 17	2
		Sound is presented clearly	18, 19	2
5.	Visual	Illustrations are presented clearly	20, 21	2
		Attractive background display	22, 23	2
		Combination in the use of color	24, 25	2
		Character selection	26, 27	2
6.	Characterization	The attractiveness of the characters	28	1
		Overall appearance integration	29, 30	2

Table 4. The Student Response Sheet Grid

No.	Aspect	Indicator	Item Number	Number of Items
1.	Media	Interesting comic media.	1	1
		Instructions/media use are clear and easy	2,3	2
		Comic media is used effectively.	4	1
2.	Material	The material presented is clear for students.	5	1
		Material is easy to understand.	6	1
		Benefits of material for students.	7	1
3.	Learning	Increase students' interest in learning.	8	1
		Fun learning.	9	1
		Obtain examples	10	1

Table 5. The Science Learning Outcomes Instrument Sheet Grid

Material	Indicator	Cognitive Level	Item Number	Number of Items
Objects and their changes	Determine the properties and examples of solid objects.	C3	1	1
	Determine the properties and examples of liquid objects.	C3	2	1
	Determine the properties and examples of gas objects.	C3	3	1
	Determines the freeze event	C3	4	1
	Determine melting events.	C3	5	1
	Determine the yawning event.	C3	6	1

Material	Indicator	Cognitive Level	Item Number	Number of Items
	Determines condensation events.	C4	7	1
	Determine sublimation events.	C3	8	1
	Determine the crystallization event.	C3	9	1
	Choose examples of freezing, melting, evaporation, condensation, sublimation and crystallization events.	C3	10	1

3. RESULT AND DISCUSSION

Result

The initial stage in this research is preparing a design for video comic learning media. The development of Comic Video learning media was carried out using the ADDIE model. This media was developed for fifth grade elementary school students. The material used in the comic video learning media is the Nature of Objects and Their Changes material for class V elementary school. The learning objectives set in the comic video learning media are that through comic videos, students know the properties of objects clearly, through comic videos, students can clearly understand changes in the form of objects. The content of comic videos consists of three parts, namely opening, content and closing. The opening section contains the comic video cover and instructions for listening to the comic video. The content of the comic video contains conversations between characters discussing the nature of objects and their changes. The closing section contains evaluation questions and a summary along with source material. The comic video media images that were developed can be seen at [Figure 1](#), [Figure 2](#), and [Figure 3](#).



Figure 1. The Opening Part

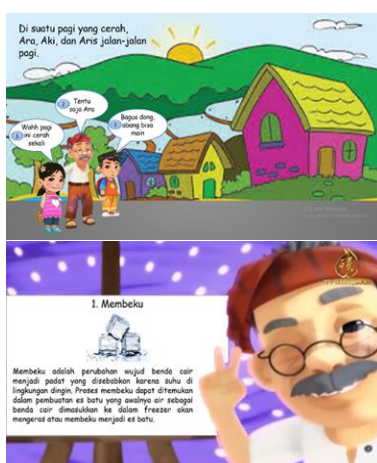


Figure 2. The Contents Section



Figure 3. The Closing Part

After the media has been designed, the media developed is then tested for validity. Validity testing in this development research is carried out from two aspects, namely media validity testing by learning material experts and media validity testing by media experts. Validity testing was carried out by one material expert and one media expert. The recapitulation of the results of the validity assessment of comic video learning media is presented in [Table 6](#).

Table 6. The Results of the Validity Assessment of the Digital Teaching Module for Elementary Science Skills Development

No.	Subject	Percentage of Validity of Teaching Materials	Qualification
1	Learning Materials Expert	90%	Very good
2	Learning Media Expert	93.33%	Very good

The next analysis is the practicality test of comic video media, where the practicality testing carried out by teachers/practitioners is assessed by the class V teacher at SD Negeri 3 Tamanbali and the practicality testing by students is assessed by 9 class V students consisting of 3 students in the individual test and 6 students in a small group test. A recapitulation of practicality test results is presented in [Table 7](#).

Table 7. The Practicality Test Results

No.	Subject	Percentage of Validity of Teaching Materials	Qualification
1	Practitioner Response Results	96.67%	Very good
2	Individual Trial Results	97.53%	Very good
3	Small Group Test Results	98.75%	Very good

After obtaining the results of the media practicality test, the research then continued to test the effectiveness of comic video media products. The effectiveness test was carried out by implementing Comic Video Learning Media into the learning process. The effectiveness test was carried out to analyze the effect of using Comic Video Learning Media on students' science learning outcomes. The analysis results include descriptive analysis results, prerequisite test results, and hypothesis test results presented in [Table 8](#), [Table 9](#), [Table 10](#), and [Table 11](#).

Table 8. The Descriptive Analysis Results

No.	Statistics	Pre-test	Post-test
1	Mean/calculated average	49.09	87.27
2	Range	70	40
3	Variance	509.09	141.81
4	Std. Deviation	22.56	11.90
5	Minimum Value	20	60
6	Maximum Value	90	100
7	Amount	540	960

Table 9. The Normality Test Results

Data Type	Class	Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Science Learning Outcomes	Pre-test	0.197	11	0.200*	0.901	11	0.188
	Post-test	0.227	11	0.118	0.863	11	0.063

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 10. The Variance Homogeneity Test Results

Test of Homogeneity of Variances					
		Levene Statistics	df1	df2	Sig.
Science Learning Outcomes	Based on Mean	3.948	1	20	0.061
	Based on Median	2.857	1	20	0.106
	Based on Median and with adjusted df	2.857	1	18.824	0.107
	Based on trimmed mean	3.616	1	20	0.072

Table 11. The Hypothesis Test Results

Paired Samples Test									
Paired Differences									
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)	
				Lower	Upper				
				Pair 1	Pre-test Post-test				-34.545

Based on the results above, it can be seen that the significance value is 0.000. In the correlated t-test, if the sig value is <0.05, then there is a significant influence between before and after using comic video

learning media on science learning outcomes for class V material at SD Negeri 3 Tamanbali. Meanwhile, if the sig value. > 0.05 , then there is no significant influence between before and after using comic video learning media on science learning outcomes for class V material at SD Negeri 3 Tamanbali. From this, it was concluded that $0.000 < 0.05$ so there was a significant influence between before and after using comic video learning media on science learning outcomes for class V material at SD Negeri 3 Tamanbali.

Discussion

This development research produced a comic video learning media product with science content on the nature of objects and their changes with the target being fifth grade elementary school students. The material used refers to the theme book 7 semester 2 of the 2013 curriculum. This comic video learning media was developed based on an analysis of needs in the field and this comic video learning media is different from other digital comics because it contains the voices of each character which is packaged into a video. The media product development process in this research follows the ADDIE development model so that it has implications for the feasibility of the resulting product. The ADDIE development model has systematic stages and allows evaluation activities to occur at each stage (Suryaningtyas et al., 2020; Syahril et al., 2019). Comic Video Learning Media has gone through a validation process by material experts and media experts. Based on validation tests, it shows that comic video learning media is valid for use in the learning process to improve student learning outcomes. This science comic video learning media was also tested for practicality by teachers/practitioners and students. The practicality test that has been carried out shows that the comic video learning media is valid, practical and effective to be applied in the learning process to improve the learning outcomes of class V students at SD Negeri 3 Tamanbali.

Judging from the learning material aspect, the comic video learning media has very good qualifications and is suitable for implementation in the learning process because the media that has been developed is in accordance with the learning that applies in schools. The material presented in comic video learning media must be in accordance with the material that applies in schools so as to reduce the occurrence of deviations in the delivery of material and make it easier for students to receive material packaged in comic video learning media and make it easier for teachers to deliver learning material and make it easier for students to understand learning material. which is abstract (Antara et al., 2022; Megantari et al., 2021). Obtaining excellent qualifications was also due to the clarity of the material presented. Having illustrative images that support the presentation of material can help students understand material concepts and help explain abstract concepts into concrete ones (Feriayanti et al., 2019; Jundu, Nendi, et al., 2020). Obtaining excellent qualifications was also due to the clarity of the material presented. Having illustrative images that support the presentation of material can help students understand material concepts and help explain abstract concepts into concrete ones (Jundu, Nendi, et al., 2020).

Judging from the learning media aspect, comic video learning media has very good qualifications and is suitable for implementation in the learning process. The presentation of material, choice of font, layout and color composition in this media is in accordance with the rules of learning media development. This is in line with the results of previous research which states that a media that is suitable for application in learning should follow the basic rules/principles of media development, which include dimensions of material presentation, choice of typeface, layout, color composition, and others (Rehusisma et al., 2017; Saputra et al., 2020). Apart from that, visual presentations also have a positive influence on students' motivation and interest in learning. Regularity of layout, correct choice of typeface, and good color composition can support students' learning conditions and change the learning atmosphere for the better (Ahmadi et al., 2021; Fitriyani, 2019).

Judging from the practical aspect of using learning media, comic videos have very good qualifications and are suitable for implementation in the learning process. Using comic video learning media can help students understand the material and clarify the material presented during the learning process. Apart from that, comic video learning media provides opportunities for students to get to know innovative learning media so that it influences their learning outcomes and can increase their insight and knowledge (Hapsari et al., 2017; Tinja et al., 2017). This is in line with previous research which states that the practicality of learning media can be seen from the ability of learning media to support the learning process in the classroom so that it is easier for teachers to direct students' attention to participate in learning, and this will influence students' motivation and interest in learning (Trust & Pektas, 2018; Utami & Abdulah, 2020).

The results obtained in this research are in line with the results of previous research which also revealed that the application of comic learning media can improve student learning outcomes (Rosyida, 2019). The results of other research reveal that digital comic media based on a scientific approach to science content is in the very valid category and is suitable for use in the learning process (Ayu et al., 2021). The results of further research reveal that digital comic media can help improve learning outcomes in material

on Pancasila values for fourth grade elementary school students (Fitri et al., 2023). So based on several research results, it can be said that comic media can significantly improve student learning outcomes.

4. CONCLUSION

The resulting product is a comic video learning media with science content on the nature of objects and their changes for fifth grade elementary school students. The development of comic video learning media was developed using the ADDIE development model so as to produce comic video learning media that is valid, practical and effective for students' science learning outcomes. It is hoped that comic video learning media can be used to improve learning outcomes in class and can be used as a reference in developing similar learning media with different topics or materials.

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