

Webtoon based e-comic the material of my dear earth my poor earth the content of IPAS grade V elementary school

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Abstract: *The development of science and technology is challenge for educators to continue create new innovations in learning process. The purpose of this research is develop and produce Webtoon based E-Comic that is feasible medium for learning IPAS on the material my dear earth my poor earth grade V elementary school. The research model in this study uses the 4D, namely: Define, Design, Develop, Disseminate. The subjects in this study were material experts, linguists, media experts, teachers and students. The results feasibility analysis based on experts obtained 91% in very good category, the practicality analysis obtained 89% in very practical category, and the effectiveness analysis obtained an average of 95% in very effective category. Based on the results, the Webtoon based E-Comic learning media on the material my dear earth my poor earth IPAS content that has been developed using the 4D model is very feasible to use.*

Keywords: *IPAS Learning; E-Comic; Webtoon*

Introduction

Education currently continues to experience dynamic changes to shape the quality of education in the future. The development of science and technology requires humans to have the skills to adapt to current conditions. One of them the presence of a new curriculum, namely the Merdeka Curriculum which is in line with the concept of "Freedom to Learn" by giving schools, educators and students the freedom to learn independently (Rahayu., 2022; Sherly., 2020). In the implementation of the Merdeka Curriculum which combines scientific topics in natural sciences with social studies, social sciences becomes natural and social sciences (IPAS) (Budiwati., 2023; Wijayanti., 2023). Sciences learning in elementary schools aims to improve critical thinking skills and understanding of natural and social phenomena. The sciences learning program must be carried out in a quality manner and be able to encourage creativity, activeness, pleasant conditions, and help students acquire inquiry skills, such as observing and investigating (Kumalasari., 2023; Salsabila., 2023).

A learning process will run effectively and efficiently if it is supported by supporting media. Learning media comes from various sources which help students to gain broader experience and knowledge during the learning process. Therefore, choosing the right media is the main key to improving students learning skills (Yasa., 2020; Rohman., 2023). Learning media are tools, approaches and strategies used for interaction and communication between educators and students during the learning process (Ibrahim., 2023; Tafonao., 2018). Learning media has an important role in increasing students interest in learning and helping them achieve learning goals. Media can also make the learning environment more interesting, active and relevant (Masykur., 2017; Nurrita., 2018).

The results of observations and interviews conducted by researchers in class V at SDN Bandungrejosari 3 Malang, revealed that the learning process carried out by educators was limited to utilizing printed books provided by the school and objects in the surrounding environment. In the learning process, the media used can be said to be less varied and learning still seems passive. This will cause boredom, decreased attention, interest and motivation of students so that they will have trouble in understanding the material. Furthermore, researchers also conducted interviews with class V students at SDN Bandungrejosari 3 Malang City, the results showed that students preferred reading picture books rather than printed books full of writing. Therefore, these two things can be combined according to the needs and characteristics of students who need electronic technology-based picture book learning media to increase students' interest in developing learning habits and motivation. Researchers chose e-comic media as an integration between electronic technology-based learning and picture books. The choice of comic media is one of the learning media that helps students understand the subject matter by providing discussions in the form of stories with unique and colorful illustrations (Angga., 2020; Cahyani., 2023).

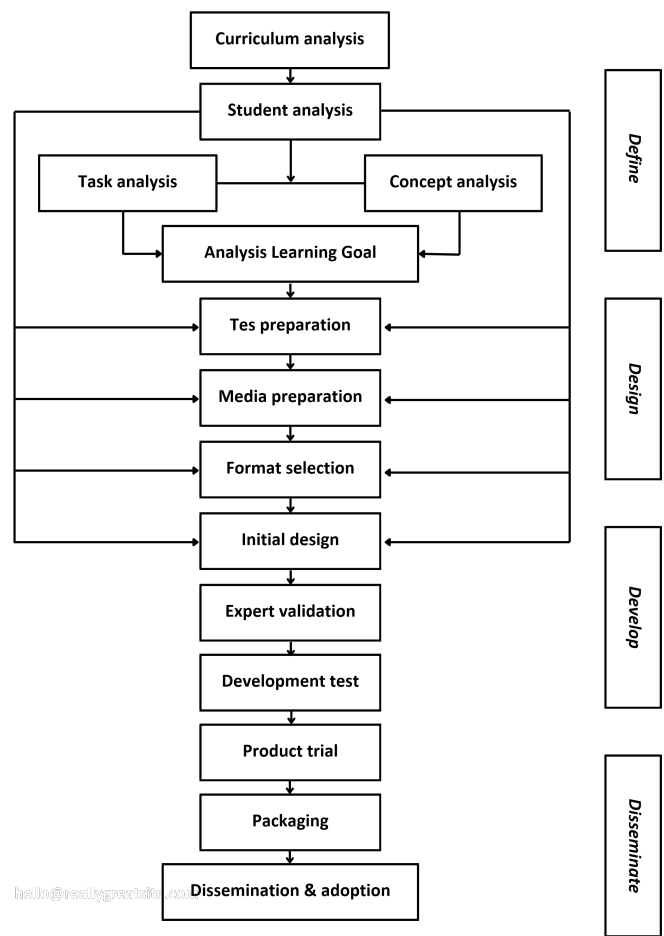
Comics are type of two-dimensional graphic media that uses a series of images to tell stories that aim to provide information to readers (Nurlatipah., 2015; Yasa., 2018). E-Comic (Electronic Comic) started from printed comics and then developed into digital versions of comics that can be accessed via the internet (Ntobuo., 2018; Siregar., 2021). E-Comic is a type of learning media that uses picture books with visual and narrative elements to convey learning material in a more interesting and easy to understand way. Webtoon-based e-comic learning media is one way to make learning meaningful for students (Hidayat & Rostikawati., 2019). Webtoon is an extension of website and cartoon containing a collection of images telling stories published digitally and can be accessed via devices that have the internet (Alfiani., 2018; Siwi., 2018). Webtoon-based e-comic learning media is very suitable for elementary school children and is used by educators as a means of supporting learning media. Using digital comics allows students to expand their knowledge and apply what they already know in the stories they read on comic media (Hamidah., 2020; Rahmatunnisa., 2023).

Previous research shows that e-comic development can provide an interesting learning atmosphere and makes it easier for students to understand the material (Dasi & Putra., 2020). The use of e-comic learning media influences improving student learning outcomes (Ummah & Istianah., 2021). Apart from that, the use of e-comic media provides very effective results in increasing interest in learning (Ningrum & Utomo., 2022). Digital comic-based learning media that refers to 21st century learning is synonymous with technology and needs to be developed (Eva & Sumantri., 2020). The e-comic media developed in this research is different from the e-comic of previous researchers. This e-comic is made more interesting using new characters that have been adapted to the material in the Natural and Social Sciences content. The material "My Dear Earth My Poor Earth" was chosen because this material is included in social studies learning material. So that students can develop thinking skills based on the realities of social life in their social environment, social studies learning materials are built by considering other social sciences. Students are asked to formulate waste management activities. After analyzing problems in the surrounding

environment, students are also asked to formulate actions that can be taken to resolve or reduce the impact of problems in the environment.

Method

This research uses a type of research method (R&D) Research and Development or research and development. According to (Sugiyono., 2016) research and development is a type of research used to produce products and test the effectiveness of the products produced. This type of research uses 4D model development research consisting of four stages; 1) Define, 2) Design, 3) Develop, and 4) Disseminate. The media development steps are shown in Figure 1.



Source: (Adaptation Thiagarajan., 1974)

Figure 1. 4D Development Flow

At the define stage, it is carried out to identify the basic problems in the research by carrying out observation and interview activities. This stage includes 4 steps, namely initial analysis, student analysis, material analysis, and formulating learning objectives. The second stage of design is carried out to produce an initial form of product design along with the research instruments used. In this stage there are 4 steps, namely test preparation, media selection, format selection, and initial design for making the E-Comic. The third stage of development is aimed at perfecting the initial design of the media to make it better and

suitable for use in learning. At this stage, product validation is carried out by material experts, language experts and media experts as well as trials by teachers and students. The fourth stage of dissemination is aimed at disseminating E-Comic media. The distribution carried out in this research was by distributing E-Comic products to teachers and students of class V elementary schools and publishing articles in scientific journals.

The type of data used is in the form of qualitative and quantitative data. Qualitative data obtained input and reviews from material experts, language experts, media experts, as well as teachers and students. Meanwhile, quantitative data was obtained from the results of calculating response questionnaires. The subject of this research involves the validation of experts and users. Validation experts are material experts, language experts and media experts. Meanwhile, users are teachers and students of class V at SDN Bandungrejosari 3, Malang City. The instruments in this research used interview sheets, observations and questionnaires. In making decisions regarding the qualifications of E-Comic media, the conversion level of achievement on a Likert scale assessment of 4 is used with the criteria (1) not good, (2) quite good, (3) good, (4) very good. Components measured include:

Table 1. Validation Instrument

Rated Aspect	Indicator	Sub Indicator
Material	Material/Content	1. Suitability of material to learning objectives
		2. Suitability of material with the indicators to be achieved
		3. Ease of understanding learning material
		4. The language used is appropriate to the characteristics of the students
	Objective	5. The material used is in accordance with students' thinking abilities
		6. The material can broaden students' knowledge
	Presentation	7. Sequence of material in presentation
		8. Clarity of the font used
		9. Suitability of illustrations to the topics discussed
		10. Clarity of punctuation
Language	Language	1. The language used is appropriate to the level of students
		2. The sentences used are simple and easy to understand
		3. The sentences used do not give rise to double meanings
		4. Accuracy in word selection in the material
		5. The terms used are in accordance with the KBBI
	Use of Language Rules E-Comic	6. Use good language rules and right
		7. The accuracy of the sentence structure is adjusted to the Learning Objectives
		8. Spelling accuracy in e-comic media content
		9. Sentence activity in e-comic media
		10. Punctuation accuracy
Media	Cover Design	1. The images used reflect the content of educational comics
		2. Attractive composition of lines and colors
		3. Suitability of the characters to the story of typeface, color, spacing, font size and title position
		4. Accurate arrangement of text and image objects
	Text Message Design	5. Suitability of spacing, font size and color types in e-comic media
		6. Accuracy of the sentences used
		7. The accuracy of using sentence and writing balloon

Rated Aspect	Indicator	Sub Indicator
		effects in e-comic media
		8. Harmony of background and text colors
		9. Balance between text and images
	Image Message Design	10. Image conformity with text message (material)
		11. The quality of the images presented
		12. Image layout with text presentation
		13. Suitability of images to student characteristics
		14. The beauty of the picture The beauty of the picture

Based on the table above, the aspects contained in the material instrument include material/content, Objective, and presentation. This instrument consists of 10 statement items assessed by the material expert regarding the e-comics developed. Aspects on the language instrument include language and the use of language rules. This instrument consists of 10 statement items assessed by linguists regarding the content of the developed electronic comic media. Aspects contained in the media instrument include cover design, text message design, and image message design. This instrument consists of 15 statement items assessed by media experts regarding the developed e-comics. Furthermore, the instrument grids for the practicality test by teachers and students are presented in table 2 as follows.

Table 2. Practicality Questionnaire

Rated Aspect	Indicator	Sub Indicator	
Teachers	Contents	1. Suitability of material in the media with learning objectives	
		2. Suitability of material in the media to students' needs	
		3. Suitability of material to student characteristics	
	Language	4. Clarity of information in the media	
		5. Language used in the media	
		6. The sentences used are simple and easy to understand	
	Material	7. Ease of understanding material concepts	
		8. Understanding of the material increases	
		9. Clarity of learning topics	
	Media	10. Coverage of material contained in the media	
		11. The use of fonts (type and size) is clear in e-comic media	
		12. The accuracy of the layout and design of e-comic media	
		13. Availability graphic illustrations and interesting pictures	
	Students	Instructional Media	14. The appearance of the media is attractive
			15. E-comic media is comfortable to use
Material		1. Ease of use of e-comic media	
		2. The e-comic media display is attractive	
		3. Accuracy of content and material	
Benefit		4. Telling stories using e-comics is more unique and interesting	
		5. The presentation of the story helps in understanding the concept of the material	
Language	6. Interesting images and storyline		
	7. E-comic media helps to better participate in learning		
	8. Through media, you become more motivated		
		9. Simple sentences and easy to understand	
		10. The use of language in the media is easy to understand	

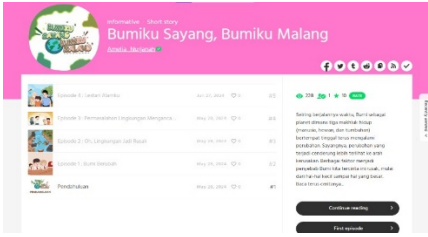
Based on the table above, the aspects contained in the teacher's practicality instrument include content, language, material, and media. This instrument consists of 15 statement items assessed by the teacher regarding the developed electronic comics. Furthermore, the aspects of the student trial instrument include learning media, material, benefits and language. The instrument consists of 10 statement items. Data analysis techniques at this stage include qualitative and quantitative data analysis techniques in the form of suggestions and improvements to webtoon-based e-comic media by experts, practitioners and users who have been filled in on questionnaire sheets. while quantitative data analysis techniques are used to measure the feasibility, practicality and effectiveness of learning media.

Results and Discussion

Webtoon-based E-Comic on the material my dear earth my poor earth, science content for class V elementary schools, was developed according to 4 stages in the 4D model which consists of several stages, namely define, design, develop, and disseminate. The define stage includes initial final analysis, student analysis, material analysis, and learning objective analysis. In implementing learning, educators and students only make use of printed books provided by the school and objects in the surrounding environment. Based on the results of this analysis, e-comic learning media is needed to increase students' interest and motivation in the learning process.

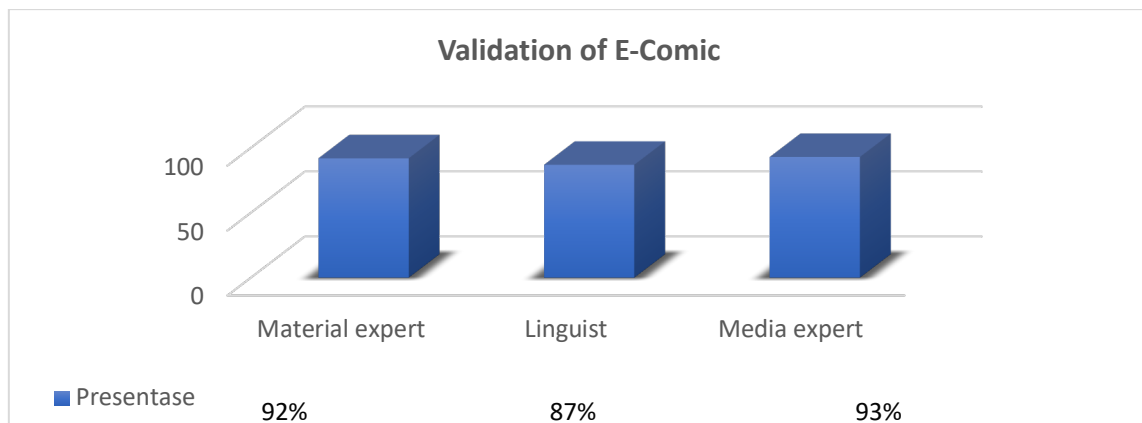
The design stage includes preparing tests which are carried out by adjusting the abilities and character of students as well as the competencies to be achieved. The researcher chose the format and media using the Clip Studio Paint, Adobe Illustrator and Webtoon platforms. The Clip Studio Paint and Adobe Illustrator platforms are used to design comics by utilizing the features in them. Next, media is needed to distribute and access E-Comics using the Webtoon application. The initial design consists of several components such as cover, foreword, learning objectives, indicators of achievement of learning objectives, character introduction, and comic narrative. At this stage, a product is produced in the form of an media e-comic webtoon based on the material my dear earth my poor earth which can be seen in table 3.

Table 3. Webtoon-based E-Comic media

No	Figure	Note
1.		Webtoon-based E-Comic front cover

No	Figure	Note
2.		The Introduction to the e-comic consists of a description of the e-comic, learning objectives, and an introduction to the characters in the e-comic.
3.		The content page of the e-comic which consists of learning topics on the material of my dear earth my poor earth

In the develop stage, the e-comic that has been designed is then validated by material experts, linguists and media experts. The results of the analysis of e-comic feasibility assessments by validators are shown in the bar chart graph in Figure 1.

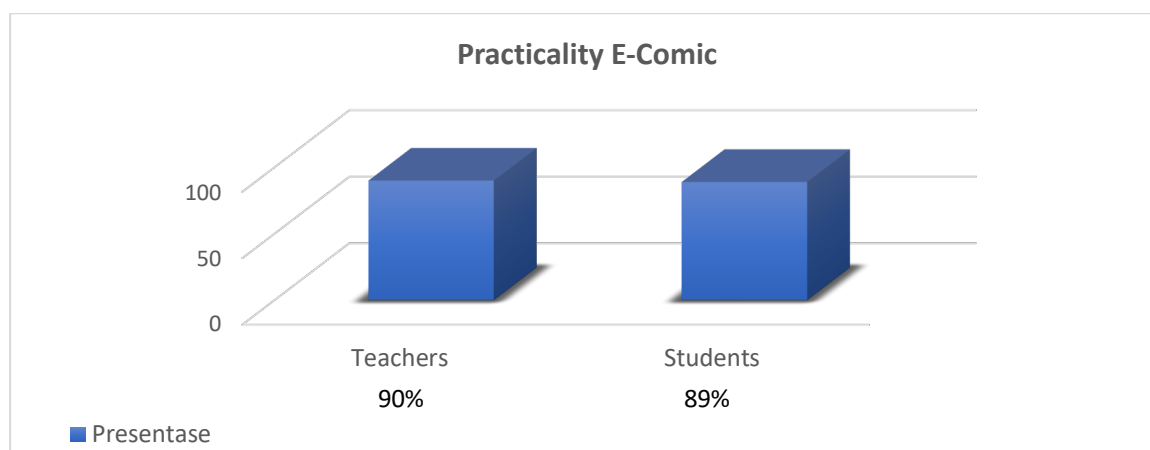


Source: (Researcher Analysis., 2024)

Figure 1. Validation of Webtoon-based E-Comic Media

Based on the validation results obtained from material experts, namely obtaining a percentage of 92% "very good" because the learning material is contained in the form of stories with illustrated images, language experts obtained a percentage of 87% "very good" because the presentation of the language provided has been adapted to the characteristics students so it is easy to understand, and media experts get a percentage of 93% "very good" because the display of the illustrations is adjusted to the material so it is interesting and the media is easy to access. So it can be concluded that webtoon-based e-comic learning media is very good for use in elementary schools. The effectiveness of the learning process is defined as the realization of learning outcomes in accordance with predetermined learning objectives (Angga., 2020). In line with (Isran & Rohani., 2018) which states that the use of media in

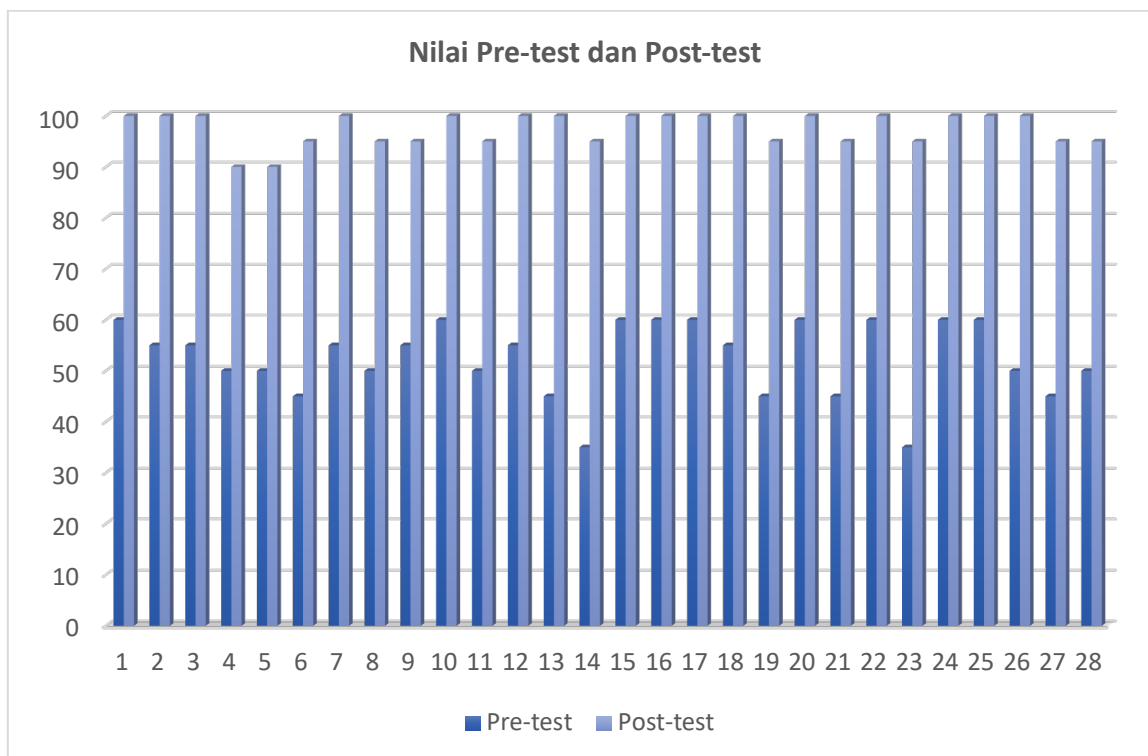
learning is an alternative to facilitate interaction between educators and students so that learning will be more effective and efficient. The use of e-comic media is more flexible because it is easy to access and the presentation of the material content is linked to everyday life, making it easier for students to understand the material (Nurrita., 2018; Damayanti., 2021). That way, students are more motivated to learn and are able to improve learning outcomes (Adriyani & Kusmaryatni., 2019). The results of the assessment of the practicality of e-comic media are shown in the bar chart graph in Figure 2.



Source: (Researcher Analysis., 2024)

Figure 2. Practicality of Webtoon-based E-Comic

Based on the practicality results obtained, it is known that the results of the teacher's questionnaire received a score with a percentage of 90% in the "very practical" category, while the overall student questionnaire scored with a percentage of 89% in the "very practical" category. So it can be concluded that webtoon-based e-comic learning media is very practical to use in elementary schools. Webtoon comic learning media is an interesting learning media because of the pictures and illustrations so that students feel happy and don't get bored easily when reading the material, as well as the use of media is efficient and easy to access anywhere (Putri & Lubis., 2018). Character design and attractive images in accordance with the material are able to motivate and make it easier for students to understand learning material. teachers and students can easily use e-comics media in learning activities practically and can be taken anywhere, and anytime (Mariana, 2023). Apart from that, e-comics as a learning medium are very suitable and more effectively implemented in learning activities because not only teachers play an active role, students are also actively involved so that teachers act as facilitators who direct students to explore their own knowledge (Khasanah., 2021; Kurniawan., 2017). The effectiveness analysis to determine the influence of webtoon-based e-comic media in this research uses the N-gain score based on pre-test and post-test scores shown in Figure 3.



Source: (Researcher Analysis., 2024)

Figure 3. Effectiveness Value of Webtoon-based E-Comic

The results of the effectiveness test of webtoon-based e-comic media were analyzed through student learning outcomes based on pre-test and post-test obtained through the trial stage for class V students at SDN Bandungrejosari 3 Malang. The results of the pre-test score with an average of 54 indicate the criteria are less effective and the results of the post-test score with an average of 97 indicate the criteria are very effective. So it can be concluded that the learning media developed has increased after using webtoon-based e-comic media. Similar research says that the images and storylines presented in webtoon comics will help students to improve the material more easily (Aliifah., 2023; Lisa., 2023). Apart from that, the delivery of varied material will provide direct learning experiences, strengthen students' understanding and memory of the learning material, and in digital comic media it will make it very easy for students to understand the material and provide imagination through the display of the material provided in the learning process (Ariyana., 2020; Hakim., 2017).

E-Comic learning media has the advantage of being very easy to use because the form of presentation is simple (Muhaimin., 2023; Sedana., 2022). Seeing images in comics can give students creative ideas, and e-comics are more interesting and intertaining (Yulianti., 2016; Ntobuo., 2018). E-Comic learning media on the topic of my dear earth my poor earth is systematically design to produce e-comic learning media that is interesting and effective for students. The webtoon based e-comic media on my dear earth my poor earth material develop in this study is different from previously develop e-comic learning media because there is no e-comic learning media that develops my dear earth my poor earth material. Techonology-based media wil mak it easier for students to learn (Firdaus, 2018; Firmadani, 2020). Electronic comic learning media can be easily accessed by students (Pinatih., 2021;

Payanti., 2022). The webtoon based e-comic developed in this study makes it easy for students to learn anytime and anywhere. Webtoon based e-comic media with the topic my dear earth my poor earth digestive system developed in this study can be accessed online. Digital comic media can be developed and is suitable for use (Hobri., 2019; Sukmanasa., 2017). Therefore, e-comic media needs to be developed (Dwiasih & Agung., 2021). It can be concluded that e-comic can make it easier for students to learn so that it has an impact on increasing student understanding. This research implies that the developed e-comic can be used by teachers in learning to assist students in learning independently.

In the disseminate stage, webtoon based e-comics for class V elementary schools have met the criteria for feasibility, practicality and effectiveness. Therefore, media webtoon based e-comic are suitable for implementation in fifth grade elementary schools. Media webtoon based e-comic is packaged in electronic form containing learning material related to daily life in accordance with the IPAS concept. The application uses a PC or smartphone to access the learning process to attract students learning attention.

Conclusion

Webtoon based e-comic learning media based on feasibility analysis results obtained from validation tests by material experts, language experts and media experts was declared very good. The results of the practicality analysis of webtoon-based e-comic learning media can be seen from the results of practicality tests on teachers and students who received the very practical category. Based on the effectiveness test results, it shows that webtoon-based e-comic media is effectively used in learning to improve student learning outcomes. The increase in student learning outcomes is shown based on the results of pre-test and post-test scores as well as students' enthusiasm in participating in learning after using webtoon-based e-comic media. So it can be concluded that webtoon based e-comic media is effectively used in science learning. With webtoon based e-comic, it is able to create fun learning activities for students so that they become more motivated to learn, are able to increase interest in learning, and make it easier to understand Natural and Social Sciences (IPAS) lessons on my dear earth my poor earth material and the importance of teachers developing learning media that is interesting and needed by students to increase students interest and attention.

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