

Students Perception of Readability of Comic-Based Physics Ethnoscience Learning Media on Sound Wave Material Using Microsoft PowerPoint Application

Selly Diani Sari¹

FKIP-UNIB Physics Education Study Program
Jl. WR. Supratman Kandang Limun Bengkulu
sellydiani01@gmail.com

Abstract

This study aims to conduct a readability test in order to describe students' perceptions of comic-based physics ethnoscience learning media on sound wave material using the Microsoft PowerPoint application. This type of research is development research. The research instrument used was a student perception questionnaire with 10 questions given to 30 respondents who were students in 3 schools, namely SMA Negeri 1, SMA Negeri 6 and SMA Negeri 9 Bengkulu City. In this study, data analysis used quantitative descriptions. Based on the results of the data obtained, it can be concluded that the comic-based physics ethnoscience learning media on sound wave material using the Microsoft PowerPoint application is very good based on the perceptions of students. This is based on the data obtained that of all statements regarding the readability of comic-based physics ethnoscience learning media, almost all of them were answered with the largest percentage being in the very good and good answer choices. This means that students agree with the statements offered on each question they fill in the perception sheet. Based on the data obtained, the average percentage of content quality aspect is 83%, the aspect of time allocation is 80% and the grammatical aspect is 87.5%. So it can be concluded from these three aspects that the module developed is very good with an overall average percentage of 83.5%.

Keywords: *Student Perception, Readability, Learning Media, Ethnoscience Physics, Comics, Sound Waves.*

A. Introduction

The 2013 curriculum is one of the current curricula in Indonesia. The 2013 curriculum has a goal to encourage students to be active in every learning material, in which students are required to pay attention to the characteristics that characterize an area as well as the local potential of the local area. Given that in a learning process, each area has potential that can be linked. The application of learning materials in everyday life in the learning process is expected to utilize the local environment as a learning resource (1).

In the 2013 curriculum, it is explained that to realize the process of character development and the quality of student competencies, a very supportive subsystem is needed. The teacher is one who acts as a subsystem in education that must be responsive to the development of culture and local wisdom, both technology and art that is around it in order to build curiosity about the culture of the environment with various problems that exist around it, by constructing the real experience it has in learning, the learning process is at the same time responsible for the preservation and conservation of noble values to the abilities of students (2).

In line with this opinion, according to Mujakhir (2012), science subjects are one of the subjects that can be developed to apply life skill learning. In accordance with the characteristics of science learning, namely studying the universe and the phenomena that occur in it. In its application to the learning process, it can be developed so that it is not only oriented to academic competence but can also be designed in such a way that students are able to understand nature and apply what they have learned in real life.

According to the opinion of Azhar (2008) Physics is a material for government education policies in several countries as a provision of human resources. This is because physics is considered as one of the stems of knowledge that is useful for the development of technology, inventions, and other sciences. Physics is a part of science, one of which is knowledge of science in physics which also influences the

development of science in life. Based on this, physics can be grouped into one of the realms of ethnoscience and a branch of science that studies natural phenomena including materials, humans, and interactions between humans and other materials. Generally, people interpret the phenomena they experience according to the beliefs that develop in the environment. This method is one of the knowledge that is called the original science of society. The original science of the community is reflected in local wisdom as an understanding of nature and culture that develops among the community.

Science learning in schools in general is still centered on the material contained in books. Science learning is still rare that really reveals the authenticity of the culture around the students' environment. The content of the material being taught has not been much integrated with culture. Looking at the current conditions, it is necessary to develop learning methods, one of which is with a varied approach, in the form of teaching materials in the form of printed media that are not only shaped like physics textbooks. The ability of teachers to combine original scientific knowledge with scientific knowledge is very much needed in science learning that applies an ethnoscience approach (3).

In everyday life, students always and always interact with the environment and culture of their respective regions, this is what can increase a potential understanding from the side of students in a learning process, especially in science learning which is developed from the perspective of local culture and wisdom. organized local events related to certain natural events.

One of the important factors that influence education in creating meaningful learning is one of them by reconstructing the knowledge possessed by students. Ethnoscience-based learning is expected to be able to bridge the blend of student culture with scientific culture in schools, so that it will be able to realize a process of developing the quality of students as the next generation of the nation in the future, which is believed to be the main factor for the growth and development of the nation.

According to Johar, Asahar., Risdianto, Eko., & Indriyati (2014) a good media ideally has four criteria, namely (a) Suitability or relevance, meaning that learning media must be in accordance with learning needs, learning activity plans, learning activity programs, learning objectives, and the characteristics of students. (b) Ease, meaning that all lesson content through the media must be easy to understand, learn or understand by students and very operational in its use. (c) Attractiveness, meaning that learning media must be able to attract and stimulate the attention of students, both in appearance, color choices, and content. The description of the contents is not confusing and can arouse the interest of students to use the media. (d) Usefulness, meaning that the contents of the learning media must be valuable or useful, contain benefits for understanding the learning material and are not wasted or useless, let alone damage students (4).

Based on this statement in this study, it is proven by obtaining the feasibility of the comic-based physics ethnoscience learning media, it is known that the characteristics of ethnoscience-based physics comics are comics in the form of physics comics printed media. Physics comics consist of a front cover and a back cover, introduction of characters in physics comics, comic content presented in a series of interrelated stories to convey sound wave material with ethnoscience-based concepts, sample questions and discussions as well as introduction to the culture of the musical instrument Dol which is a feature typical culture of the city of Bengkulu. Comics are intended as a variation of print-based learning media in addition to physics textbooks that are given and lent by the school to students. Comics are presented with pictures of interesting characters and equipped with place backgrounds and color gradations to make the appearance of the contents in the comics more colorful.

According to Gitus, Eri Winarti., Susilawati, Harto, Nuroso (2016) Learning science oriented to local wisdom will create an inculturation process in which original science that has noble values that have lived and developed in society will not be uprooted from its cultural roots after studying Western modern science. As well as science-oriented local wisdom comics can also play a role in preserving culture, considering the presentation of phenomena and comic characters with the nuances of local science wisdom. This statement is in accordance with the results of research on the development of comic-based physics ethnoscience learning media that conveys sound wave material using the concept of ethnoscience associated with one of the traditional musical instruments Dol which is a characteristic of Bengkulu City culture (5).

According to Yasa (2013), comics media have the potential to be preferred by students because with pictures, learning topics will be easier to understand and remember through pictures that are read and can improve students' understanding of concepts so that student learning outcomes can also increase. This is supported by the results of a questionnaire on student perceptions of the physics ethnoscience learning media developed with a percentage obtained of 83.5% which is classified in the "very good" category.

Supporting the explanation above, the purpose of this study is to describe students' perceptions of the comic-based physics ethnoscience learning media on sound wave material using the Microsoft

PowerPoint application. According to Rahmad (2003) perception is the interpretation of an object, event or information that is based on the life experience of someone who does that interpretation. Based on the description above, it is necessary to conduct a readability test to describe students' perceptions of comic-based physics ethnosience learning media on sound wave material using the Microsoft PowerPoint application.

B. Reseach Methods

The study was conducted in May 2021. The research sample was 30 students in 3 schools, namely SMA Negeri 1, SMA Negeri 6, and SMA Negeri 9 Bengkulu City. The data collection technique used in the readability test to determine the students' perceptions is a questionnaire technique. The research instrument used was a questionnaire sheet on students' perceptions of the readability of comic-based physics ethnosience learning media on sound wave material using the Microsoft PowerPoint application. The data analysis technique used is quantitative descriptive analysis. The readability test was carried out on the data obtained in the form of a percentage. The percentage is obtained based on the Likert scale calculation. With a Likert scale, the variables to be measured are translated into variable indicators. Furthermore, these indicators are used as guidelines in compiling items in the form of questions or statements. Instrument items are rated quantitatively on four scales, namely: 1) very bad (STB), 2) not good (TB), 3) good (B), and 4) very good (SB). Furthermore, the interval data can be analyzed by calculating the percentage of answers based on the scoring of each answer from the respondents with the following formula:

$$P = \frac{n}{N} \times 100\% \tag{1}$$

Equation (1) has information, namely for P is the average percentage, n is the score obtained and N is the number of maximum scores.

Then calculate the percentage score that can be calculated using the formula:

$$\% \text{ interpretasi skor} = \frac{\sum \text{skorperolehan}}{\sum \text{skormaksimum}} \times 100\% \tag{2}$$

Table 1. Interpretation of Scores on the Model Rating Scale

| Percentage (%) | Category |
|----------------|---------------|
| 0 % - 25 % | Not very good |
| 26 % - 50 % | Not good |
| 51 % - 75 % | Pretty good |
| 76 % - 100 % | Very good |

[1]

C. Result and Discussion

Based on the results of students' perceptions of the readability of comic-based physics ethnosience learning media conducted at three schools, namely SMA Negeri 1, SMA Negeri 6, and SMA Negeri 9 Bengkulu City, the results obtained from students in class XI MIPA which include aspects of content quality, usage time , and grammar. The results of the readability of students towards comic-based physics ethnosience learning media products on the aspect of content quality at SMA Negeri 1 Bengkulu City got a perception result of 76% which entered into good criteria, SMA Negeri 6 Bengkulu City got a perception result on the aspect of content quality by 89%, and in SMA Negeri 9 Bengkulu City, the perception of content quality aspects was 83.75%. So that the results of the average perception of the three schools on the comic-based physics ethnosience learning media in this aspect of the quality of the content get a percentage of 83% which falls into the very good criteria. The results of legibility on the aspect of content quality can be seen in the following table:

Table 2. Readability Results on Content Quality Aspects

| Student | Total score (n) | Maximum skor (N) | Percentage | Category |
|---------|-----------------|------------------|------------|----------|
|---------|-----------------|------------------|------------|----------|

$$P = \frac{n}{N} \times 100\%$$

| | | | | |
|-------------------------------------|-----|-----|-------|-----------|
| Students of SMAN 1 Bengkulu City | 183 | 240 | 76 | Good |
| Students of SMAN 6 Bengkulu City | 214 | 240 | 89 | Very good |
| Students of SMAN 9 Bengkulu City | 201 | 240 | 83,75 | Very good |
| Amount | 598 | 720 | 83 | Very good |

The results of student readability of comic-based physics ethnosience learning media products in the aspect of time allocation at SMA Negeri 1 Bengkulu City got a perception result of 73.75% which was included in good criteria, SMA Negeri 6 Bengkulu City got a perception result on the allocation of time usage of 81% , and in SMA Negeri 9 Bengkulu City, the perception result on the allocation of time usage is 85%. So that the results of the average perception of the three schools on the comic-based physics ethnosience learning media in the aspect of presenting this material get a percentage of 80% which falls into the very good criteria. The results of legibility on the aspect of time allocation are seen in the following table:

Table 3. Readability Results on Aspects of Time Allocation of Use

$$P = \frac{n}{N} \times 100\%$$

| Student | Total score (n) | maximum score (N) | Percentage | Category |
|-------------------------------------|-----------------|-------------------|------------|-----------|
| Students of SMAN 1 Bengkulu City | 59 | 80 | 76 | Good |
| Students of SMAN 1 Bengkulu City | 65 | 80 | 89 | Very good |
| Students of SMAN 1 Bengkulu City | 68 | 80 | 83,75 | Very good |
| Amount | 192 | 240 | 80 | Very good |

The results of the readability of students towards comic-based physics ethnosience learning media products in the grammatical aspect at SMA Negeri 1 Bengkulu City get a perception result of 80% which is included in the very good criteria, SMA Negeri 6 Bengkulu City gets a perception result on the grammatical aspect of 95% , and in SMA Negeri 9 Bengkulu City, the perception result on the grammatical aspect was 87.5%. So that the results of the average perception of the three schools on the comic-based physics ethnosience learning media in this grammatical aspect get a percentage of 87.5% which falls into the very good criteria. The results of legibility in grammatical aspects can be seen in the following table:

Table 4. Readability Results on Grammar Aspects

$$P = \frac{n}{N} \times 100\%$$

| Student | Total score (n) | maximum score (N) | Percentage | Category |
|-------------------------------------|-----------------|-------------------|------------|-----------|
| Students of SMAN 1 Bengkulu City | 64 | 80 | 76 | Good |
| Students of SMAN 1 Bengkulu City | 76 | 80 | 89 | Very good |
| Students of SMAN 1 Bengkulu City | 70 | 80 | 83,75 | Very good |
| Amount | 210 | 240 | 87,5 | Very good |

Based on the average percentage of students' perceptions on aspects of content quality, time allocation, and grammar, which were carried out in three schools, namely SMA Negeri 1, SMA Negeri 6, and SMA Negeri 9 Bengkulu City with a total of 30 students in class XI MIPA 10 students each in each school, so it can be concluded that the comic-based physics ethnosience learning media on sound wave material using the developed Microsoft PowerPoint application belongs to very good criteria with an average percentage of 83.5% from 100% . This means that the comic-based physics ethnosience learning media on sound wave material using the Microsoft PowerPoint application has met the aspects of content quality, time allocation and grammar. The final results of legibility based on these three aspects can be seen in the following table:

Tabel 5. Hasil Akhir Keterbacaan Media Berdasarkan Persepsi Peserta Didik

| Aspects | Average value | Criteria |
|--------------------------|---------------|-----------|
| Content quality | 83% | Very good |
| Allocation of usage time | 80% | Very good |
| Grammar | 87,5% | Very good |
| Average | 83,5% | Very good |

Students' perceptions based on the results of readability tests conducted in three schools in Bengkulu city, namely SMA Negeri 1, SMA Negeri 6, and SMA Negeri 9 Bengkulu City in class XI MIPA students, got the final result of perceptions of the comic-based physics ethnosience learning media which was very well from students. Overall, on the three aspects including content quality, the time allocation for using grammar is in the very good category with a percentage of 83.5%, this result is obtained because this learning media presents According to Johar, Asahar., Risdianto, Eko., & Indriyati (2014) ideally good media have four criteria, namely (a) Suitability or relevance, meaning that learning media must be in accordance with learning needs, learning activity plans, learning activity programs, learning objectives, and student characteristics. (b) Ease, meaning that all lesson content through the media must be easy to understand, learn or understand by students and very operational in its use. (c) Attractiveness, meaning that learning media must be able to attract and stimulate the attention of students, both in appearance, color choices, and content. The description of the contents is not confusing and can arouse the interest of students to use the media. (d) Usefulness, meaning that the contents of the learning media must be valuable or useful, contain benefits for understanding the learning material and are not wasted or useless, let alone damage students.

Based on this statement in this study, as evidenced by the feasibility of the comic-based physics ethnosience learning media, it is known the characteristics of ethnosience-based physics comics, namely comics in the form of physics comics printed media. Physics comics consist of a front cover and a back cover, introduction of characters in physics comics, comic content presented in a series of interrelated stories to convey sound wave material with ethnosience-based concepts, sample questions and discussions as well as introduction to the culture of the musical instrument Dol which is a feature typical culture of the city of Bengkulu. Comics are intended as a variation of print-based learning media in addition to the printed physics books that are given and lent by the school to students. Comics are presented with pictures of interesting characters and are equipped with place backgrounds and color gradations to make the appearance of the contents in the comics more colorful.

These results were obtained because students needed other learning resources besides books available at school, so students felt interested and enthusiastic in learning physics using comic-based physics ethnosience learning media that had been developed. This is in line with the statement. According to Yasa (2013), comics media have the potential to be preferred by students because with pictures, learning topics will be easier to understand and remember through pictures that are read and can improve students' understanding of concepts so that student learning outcomes can also be achieved. increase. This is supported by the results of a questionnaire on student perceptions of the physics ethnosience learning media developed with a percentage obtained of 83.5% which is classified in the "very good" category.

Based on all the data obtained from the questionnaire of students' perceptions of the readability of the learning modules that have been developed, it can be concluded that the comic-based physics ethnosience learning media on sound wave material using the Microsoft PowerPoint application based on students' perceptions is very good, so that according to students, comic-based learning media this can be an alternative in helping self-study in understanding physics material.

D. Conclusion

Based on the research and development that has been done, it can be said that based on the average results of the overall data of students on the readability of comic-based physics ethnosience learning media on sound wave material using the Microsoft PowerPoint application, this criterion is very good with an average percentage of 83, 5% which includes aspects of quality, time allocation and grammar so that according to students, this comic-based physics ethnosience learning media can be an alternative in helping independent learning in understanding physics material.

E. Acknowledgement

The authors would like to thank the expert validators (Dr. Iwan Setiawan, S.Si., M.Sc., Andik Purwanto, M.Sc.) as well as the students of class XI MIPA at SMA Negeri 1, SMA Negeri 6 and SMA Negeri 9 Bengkulu City, which has assisted in researching the development of this comic-based physics ethnosience learning media.

References

- [1]. Baskoro Ra, Rosdiana L. The Effectiveness of Ethnosience-Based Guided Discovery Worksheets to Improve Student Learning Outcomes of Rahma Ayunda Middle School Students Baskoro Laily Rosdiana Abstract The Purpose Of This Research Is To Describe The Effectiveness Of Guided Discovery Based On Ethnosience. *E-Journal-Pensa*. 2018;06(2):89–93.
- [2]. Yuliana I. Ethnosience-Based Learning in Realizing Character Education for Elementary School Students. *Else (Elementary Sch Educ Journal) J Elementary School Educator and Learning*. 2017;1(2a):98–106.
- [3]. Dinissjah Mj, Nirwana N, Risdianto E. The Use of Ethnosience-Based Direct Instruction Learning Model in Physics Learning to Improve Students' Critical Thinking Ability. *J Fis coil*. 2019;2(2):99–104.
- [4]. Johar, Asahar., Risdianto, Eko. And, Indriyati Daf. Design and Implementation of Web-Based Learning Media in the Field of English Studies in Class VII SMP Negeri 1 Bengkulu City Using Php and Mysql. *J Recursive*. 2014;2(1).
- [5]. Winarti Ge, Nuroso H. Trial of Cartoon Comics Related to Ethnosience in Science Learning to Increase Students' Interest in Learning. 2016;(1):255–62.
- [6]. Tarmiji, Basyah Mn, Yunus M. Students' Perceptions of Teacher Readiness in the Learning Process (Study at SMP Negeri 18, Banda Aceh). *J Ilm Unsyiah Citizenship Educator*. 2016;1(1):41–8.
- [7]. Hayati S, Budi As, Handoko E. Development of Physics Flipbook Learning Media to Improve Student Learning Outcomes. *Pros Semin Nas Fis Snf2015*. 2015;Iv:49–54.