JMKSP (Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan)
Volume 7 Issue 1 (2022) Page 241-257
ISSN 2614-8021 (Online) 2548-7094 (Print)

Need Response Analysis to the Development of E-Comics in Material Quantities and Units

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Received 24 September 2021; Revised 3 December 2021;
Accepted 30 January 2022

Abstract: This research aims to analyze the response to the needs of E-Comic-based learning media for high school students. Data analysis techniques are carried out using quantitative data analysis and concluded with qualitative analysis. This study is a Descriptive study that is part of the R n D study with the ADDIE model. In this study the stage used is the stage of needs analysis, the instrument used in this study is a school observation sheet, interview sheet, and a need questionnaire sheet for E-Comic-based learning media. Data collection techniques are using observation data, interviews, and questionnaire data. The subjects used in this study were physics teachers and X-class learners at SMA N 6 and SMA N 8 Bengkulu City with a total of 169 students and 5 teachers. The results of this study showed that the instrument used was valid and reliable. The results of this study also showed that high school students and teachers strongly agree and needed E-Comic-based learning media. The results of this study showed that the instrument used was valid and reliable. Therefore, from these results, researchers hope to contribute to education practitioners in order to develop teaching materials in the form of E-Comic Materials and Units for students.

Keyword: Learning Motivation, Learning Media, E-Comics

1. Introduction

In the 21st century learning is characterized by the development of information digitally. This is what is called the industrial revolution, especially in the information industry. At this time students and teachers are required to be literate to digital technology, because teachers are not the only source of student learning, so every student is required to be able to find other learning resources besides teachers in school (Syahputra, 2019). The 4.0 industrial revolution in the 21st century has an impact on various fields, one of which is in the field of education. In the industrial revolution 4.0, educators play an important role as a major component in the success of teaching and learning. Therefore, educators must be prepared more maturely and updated again in order to prepare generation Z students in the face of the industrial revolution 4.0 (Harahap, 2018).

Generation Z is a digital generation that always involves technology in various activities, such as communicating, socializing, playing, and also learning. The birth of generation Z is in line with the development of technology. This is what causes generation Z to have a character that likes technology, flexible, fast, and all digital (Moore et al., 2017) . Learning in generation Z is more inclined to the use of digital tools. This is what makes them fully involved in the learning process. Therefore, these gen Z students need to be prepared to thrive in the 4.0 industrial revolution (Cholily et al., 2019) . The birth of the curriculum in Indonesia must adjust to the times and must adjust to the needs of the development of learners in the era of the industrial revolution 4.0. The 2013 curriculum is the last curriculum after 10 fundamental curriculum changes. In the 2013 curriculum this revision there is a formulation of 21st century learning as a new paradigm of educational institutions that emphasize the ability of learners (Fernandes, 2019).

In Indonesia the quality of education depends on how the teaching and learning process takes place. According to decree number 81 A of 2013 which states that the learning process or learning activities is an educational process that provides opportunities for learners to develop their potential into an increasingly increasing ability in attitudes, knowledge, and skills needed. Learning in the revised 2013 curriculum is expected to be a fun learning, especially in technology-based learning, thus making the learning process becomes student-centered (Zuhri et al., 2014). Education is part of a process that is expected to

achieve an educative goal and able to encourage and motivate learners in doing good and useful things (Susanti, 2017).

At this time the covid-19 pandemic still hit almost all parts of the world including Indonesia. Pandemic covid-19 has made many major changes in various fields, especially in the field of education. Covid-19 imposes an education level to use the learning system from home by using online learning media. This is what leads to the lack of effective learning system (Batu-bara et al., 2021). At the time of the covid-19 pandemic is a big challenge for teachers, lecturers, and parents. Not a few parents complain about the effects of this online learning. In the application of online learning, it can not be separated from the obstacles of learning, namely the number of areas that experience technological limitations, weak networks, and limited internet quotas. In addition, teachers also experience obstacles in this online learning. Especially for teachers who are still less likely to use technology. Curriculum and learning content also need to be formulated appropriately so that the education provided remains quality and can provide motivation to students in following learning (Atsani, 2020).

Motivation is one of the factors of achieving student learning outcomes. This is very important where a good motivation will lead to the desire to understand the material delivered by the teacher. Motivated students tend to look for learning resources not only from teachers but from various existing media (Simamora et al., 2020).

During the covid-19 pandemic, student learning motivation often decreases slightly. Motivation is a situation that exists within the student that plays a role to encourage and direct the behavior and goals to be achieved. Motivation is very important, especially in the world of education. Student motivation to learn not only has a role in trying students to engage in academic activities. However, motivation is also a driver that can direct and strengthen students' learning activities to achieve the goals they will achieve (Budiarti & Haryanto, 2016).

The medium of learning is a set of tools that can help in the process of understanding students in learning. At this time the learning media has been widely used by teachers. This is done so that students can better understand the subject matter provided. However, at this time teachers have difficulty in determining learning media that are suitable for learning in this covid-19 pandemic (Habibah et al., 2020).

In essence, learning resources are whatever is used and provides subject matter so that learners experience the learning process. At this time teachers are not the only source of learning for students, because from the definition of learning resources is something that can be utilized for the learning process (Erwin et al., 2021).

Student motivation can be improved by the presence of interesting learning media and can increase the attractiveness of students to learn. One of the learning media that can attract student learning motivation in learning during the Covid-19 pandemic is by utilizing E-Comics (Electronic Comics). E-Comics is a learning medium that is much loved by students, this is because when reading comics or picture books can attract students' attention so that it can cause a good imagination in student thinking (Siregar et al., 2019).

Physics is a science that we often find in everyday life. Physics belongs to the IPA family, this is what causes physics to have the same characteristics as IPA. Therefore, physics is interpreted as a lesson that can teach various knowledge that can develop the power of reason and analysis so that almost all problems related to nature can be understood (Sinulingga & Munte, 2012) . One of the physical materials taught in high school is the matter of magnitude and units. Understanding the material of magnitude and units as the first topic of discussion is very important, because it will greatly affect the understanding of the next topic of discussion. This material of magnitude and units is very suitable if taught using E-Comic-based learning media. This is evidenced by the results of interviews from 5 physics teachers consisting of 3 physics teachers from SMA N 6 Bengkulu City and 2 physics teachers from SMA N 8 Bengkulu City. From the results of the interview obtained the results that the material of magnitude and units is the advanced material of junior high school to high school material, so that with the E-Comic learning media can increase student motivation for physics learning.

Based on the results of observation activities at two state high schools in Bengkulu City, namely in SMA N 6 and SMA N 8 Bengkulu City obtained results that in the school curriculum used is curriculum 2013. Then the teaching materials that are often used are package books, modules, ppt materials, LKPD, and learning videos. In addition, teachers also need this E-Comic learning medium as a new learning medium that can increase student motivation in learning. Evident

from the results of teacher interviews that they need learning media that can increase student motivation in learning, especially in the eyes of physics.

Based on the above explanation, the author will conduct research with the aim to analyze the response of high school students to the needs of E-Comic development on material quantities and units.

2. Methods

This research is descriptive research that is part of R&D (Research and Depelovment) research with the ADDIE model. ADDIE model is spread into 5 stages, namely analysis, design, development, implementation, and evaluation. In this study the stage used is the stage of needs analysis. This research was conducted at two public high schools, namely SMA N 6 Bengkulu City and SMA N 8 Bengkulu City. The population taken in the study were 10th grade high school students and teachers. This study was conducted in August 2021 in Bengkulu City. The data collection technique in this study is using observation data, interviews, and questionnaire data. The instruments used in this study are observation sheets, interview sheets, and sheets meeting the needs of students and teachers towards E-Comic-based learning media. Data analysis techniques in this study are quantitative analysis techniques and are concluded by qualitative analytical methods. Quantitative analysis technique is a statistical measurement of the needs of students and teachers that refers to the answers to the research questionnaire filled by 169 students and 5 teachers.

In this study each question item was tested using a validity test and reliability test. This is done to find out if the instrument provided is worth using to obtain the data needed by the researcher. The rules of the decision to know reliable or not the data, the rules of the decision taken are:

Reliable: if Cronbach's Alpha value is greater than the table's r value (Cronbach's Alpha > r table)
Not Reliable: if Cronbach's Alpha value is less than the table's r value (Cronbach's Alpha < r table) (Risdianto et al., 2021).

The decision rule to know if the indicator in the questionnaire is said to be valid if the value r calculates > from the value of the table r. In addition, the study

also used data management in the form of graphs and used percentage analysis of student and teacher responses (Dewi & Sudaryanto, 2020).

This study uses a measurement scale that is likert scale. The liker scale is a psychometric scale commonly used in questionnaires, and is the most widely used scale in survey research. The form of likert scale answer consists of strongly agreeing, agreeing, disagreeing, and strongly disagreeing. On the likert scale the approval rate in question of 4 scale options that have gradations from Strongly Agreed (SS) to Strongly Disagree (STS). These 4 options can be seen in the table below:

Table 1. Likert Scale Assessment Score

Information	Value
Strongly Agree (SS)	4
Agree (S)	3
Disagree (TS)	2
Strongly Disagree (STS)	1

(Taluke et al., 2019)

Each item of teacher and student answers is processed using the likert scale to get the results of the determination percentage. In this study to find out how many respondents strongly agree, agree, disagree, and strongly disagree with the management of data questionnaires by creating data intervals and the results are made in a graph. Each item is based on the answers of students and teachers who are processed using formulas. Previously, first searched for the average value and relative frequency value of the questionnaire, then the formula to find the average value is as follows:

$$M_x = \frac{\sum x}{N}$$

Description :
Mx = Mean (average)
∑x = the total number of
N scores = the number of scores.

After that, the calculation of the percentage of the score calculated using the formula below: Percentage score (%) = $\frac{Average\ Score}{Highest\ score}\ x\ 100\%$. The next step is to analyze the validation results of the percentages known to be matched with the interpretation criteria in the following table:

Table 2. Likert Scale Achievements

Percentage	Interpretation
0% - 25%	Strongly Agree
26% - 50%	Agree
51% - 75 %	Disagree
76% - 100	Strongly Disagree

With the table above, researchers can see the percentage of assessment results are feasible or not used as a learning medium (Melianti et al., 2020). With the likert scale, the variable to be measured is spelled out into a variable indicator. Furthermore, the indicator is used as a guideline in compiling items in the form of questions or statements (Sugiyono, 2013).

3. Results And Discussion

Student Response

In this study, the questionnaire used is the student's needs. The assessment used in this study is a likert scale with a maximum score of 4 and a minimum score of 1. Each question used in this study in the feasibility test uses validity tests and reliability tests, this is done to find out if the instrument used is suitable for research. For the results of the calculation of the validity of the data can be seen in table 3. In table 3 it can be seen that all items have an r-count value greater than r-table which means all items on the box are valid.

Table 3. Results of Validity Test Item

Number of Items	r-Calculate	r-Table	Description
1	0,556		Valid
2	0,198		Valid
3	0,553		Valid
4	0,603		Valid
5	0,549		Valid
6	0,542		Valid
7	0,673		Valid
8	0,449		Valid
9	0,603		Valid
10	0,470		Valid
11	0,461	0,150	Valid
12	0,455		Valid
13	0,409		Valid
14	0,198		Valid
15	0,542		Valid
16	0,684		Valid
17	0,343		Valid
18	0,542		Valid
19	0,684		Valid
20	0,449		Valid
21	0,603		Valid

Tabel 4. Case Processing Summary

Case Processing Summary

		N	%
Cases	Valid	169	100.0
	Excluded	0	.0
	Total	169	100.0

a. Listwise deletion based on all variables in the procedure.

Based on the results of validation tests, results are obtained as in table 4. Case processing summary that describes the number of valid respondents (N) is 169 respondents with a percentage of 100%. In table 4 this also describes excluded and total overall data. For the excluded data the number is zero, while for the total overall data is 169 respondents (N) with a percentage of 100%. After

the validation test, the data is carried out. The results of the data reliableness test can be seen in table 5 below.

Tabel 5. Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.850	21

Based on the results obtained from the data reliability test, the results are obtained as in table 5. Reliability statistics that describe there are 21 items of questions with calculations using the alpha Cronbach method then obtained a score of 0.850. The resulting Cronbach's Alpha score is compared to the product moment r value table. Using the r table distribution to $\alpha = 0.05$, the value = 0.150 is obtained, after that compared to Cronbach's Alpha value of 0.850.

Thus it can be decided that Cronbach's alpha value of $0.850 > 0.150$, so that the data is said to be reliable or reliable. The percentage of student response to the needs of E-Comic-based learning media can be known through the data processing in table 6.

In this study there are indicators about the needs of students for E-Comic-based learning media. This indicator shows the need for students to E-Comic-based learning media as much as 59.4% of students. This data is obtained from the results of student needs. This is in line with the research conducted by (Afifah et al., 2018) . Which shows the percentage of indicators of students' need for comic learning media as much as 83.59% of students who are interested in comic learning media. So, researchers know that students need e-comic-based learning media.

Increasing student learning motivation during the Covid-19 pandemic is very important especially in the eyes of physics, because at the time of the Covid-19 pandemic, student learning motivation often decreases. Therefore, researchers plan to develop e-comic-based learning media on material quantities and units (Budiarti & Haryanto, 2016). E-Comic-based learning media is a learning medium that can be used for the learning process. This E-Comic based learning media has several advantages, namely: 1). E-comics can add the words of the reader; 2) Can make it easier for readers to find abstract problem formulations; 3) Can increase

children's motivation and learning interests; 4). All the storylines lead to one thing that is goodness or other studies (Riwanto & Wulandari, 2018).

Table 6. Results of Response Data to Student Needs

Respondents	Average score	Highest score	Persentase $P = \frac{\text{Average score}}{\text{Highest score}} x\ 100\ \%$	Category
169 High school students	63,8816	84	76,04 %	Strongly Agree

Table 6 explains that students strongly agree with E-Comic-based learning media, this is indicated by the large percentage obtained at 76.04%. According to the likert scale interpretation table for data with a percentage of 76% - 100% categorized strongly agree. This research is in line with research conducted by (Lijana et al., 2018). From the results obtained, it can be concluded that student respondents to comic learning media on ecological material in class X high school are categorized as agreeing with a percentage of 73.9%. From the results of analysis data that has been done, then the results of 76.04% which shows that students strongly agree.

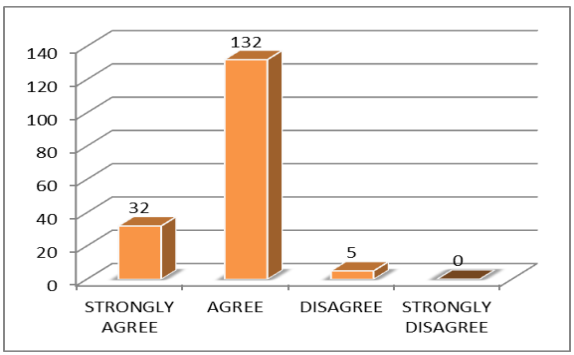

Figure 1. Student number bar diagram against category items

The diagram above explains that from the total number of 169 respondents, namely students in 2 high school levels, namely SMA N 6 Bengkulu City and

SMA N 8 Bengkulu City. From the results of the bar diagram above obtained 32 students with categories strongly agree, 132 students with categories agree, 5 students with categories disagree while for categories strongly disagree consist of 0 students. So from the diagram it can be stated that high school students in Bengkulu City agree with the development of E-Comic-based learning media on material quantities and units.

Teacher Response

This study used teacher needs questionnaires with 4 assessment score choices. The maximum score of each item is worth 4 while for the minimum score each item is worth 1. The assessments conducted in this study are validity tests, reliability tests, and likert scales. This assessment is done to find out if each of these instruments is suitable for research data retrieval. In table 7 Case processing summary shows the calculation results of the validity of the data.

Tabel 7. Case Processing Summary

Case Processing Summary			
		N	%
Cases	Valid	5	100.0
	Excludeda	0	.0
	Total	5	100.0

a. Listwise deletion based on all variables in the procedure.

In table 6. Case Processing Summary explained that there are 5 respondents with a percentage of 100%. In table 7, the total data is 5 respondents (N) with a percentage of 100%. After the data validity test, the data reliability test is carried out. The results of the data reliableness test can be seen in table 7 below.

Tabel 8. Reliabelity Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.839	21

From table 8, Reliabelity Satistics described the results of the data reliabelity test. Based on the table above, it was found that there were 21 question items with calculations using cronbach's alpha method so that a score of 0.839 was obtained. Cronbach's alpha value is compared to the product moment value table. Using the r table distribution to $\alpha = 0.05$, the value = 0.754 is obtained, after that compared to Cronbach's Alpha value of 0.839.

Thus it can be decided that Cronbach's alpha value of 0.839 > 0.754, so that the data is said to be reliable or reliable. The percentage of student response to the needs of E-Comic-based learning media can be known through the data processing in table 9.

Table 9. Results of Response Data to Student Needs

Respondents	Average score	Highest score	Persentase $P = \frac{\text{Average score}}{\text{Highest score}} \times 100\ \%$	Category
5 Teachers	71,6	84	85,23 %	Strongly Agree

Table 9. explains that students strongly agree with E-Comic-based learning media, this is shown by the large percentage obtained at 85.23%. According to the likert scale interpretation table for data with a percentage of 76% - 100% categorized strongly agree.

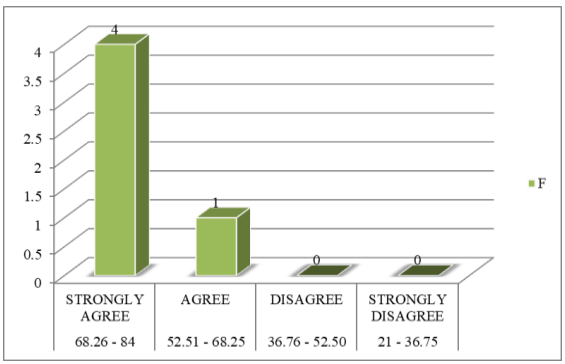

Figure 2. Teacher number bar diagram of category items

The diagram above explains that from the total number of 5 respondents, namely teachers in 2 high school levels, namely SMA N 6 Bengkulu City and SMA N 8 Bengkulu City. From the results of the bar diagram above 4 teachers with categories strongly agree, 1 teacher with categories agree, while for categories disagree and strongly disagree consists of 0 teachers. So from the diagram it can be stated that high school teachers in Bengkulu City agree with the development of E-Comic-based learning media on material quantities and units.

These results are in line with research conducted by (Afifah et al., 2018). About the relationship of comic learning media with the motivation of learning class VII students on the material system of life organization shows that students' interest in comic media used in the learning process as much as 83.59% of students. Thus, it was concluded that students are interested in comic media. Similarly, in the research conducted (Widyawati & Prodjosantoso, 2015). About the development of IPA comic media to increase learning motivation and character of junior high school students showed that based on the results of observations and studies in the field came to the conclusion that SMP muhammadiyah 2 Yogyakarta needs comics. In addition, this research is also in line with the research conducted by (Lijana et al., 2018) . Which explains that the student's response to comic learning media on ecological material in class X high school is categorized as a strong response with an average response of 73.9%.

4. Conclusion

Based on the results of observations, interviews, and questionnaire analysis that has been conducted on the response of the needs of students and physics teachers in 2 schools, namely SMAN 6 and SMAN 8 Bengkulu City to the development of E-Comic-based learning media on material quantities and units. So it can be concluded that the results of the analysis of the needs of students and teachers to E-Comic-based learning media on material quantities and units show that the media is needed by students and teachers to support the learning process. The results of this study also showed that the instrument used was valid and reliable.

Acknowledgement

The author thank to the Physics Education Study Program of the Faculty of Teacher Training and Education, University of Bengkulu which has given

permission to the author to participate in MBKM research activities where this journal is one of the results. Then I also thanked the school who were willing and allowed me to do research at the high school.

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