



Jenis Artikel: *orginal research*

## Application of Comic Media to Improve Learning Outcomes and Educational Affective Students on Straight Motion Material in Class VIII SMP Negeri 1 DarulImarah Aceh Besar

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**ABSTRACT.** Based on the results of observations in the field, most students at SMPN 1 DarulImarah Aceh Besar school tend to like subjects without mathematics, one of which is art, at the time of observation there were even students who came out of class to make art and chose not science subjects because according to students that science is very complicated. With the presence of comic media it is hoped that it will arouse students' enthusiasm for learning, because comic media is an alternative media for playing while learning. The purpose of this study was to determine whether the application of comic media can improve cognitive and affective learning outcomes of students in straight-motion material in class VIII of SMPN 1 DarulImarah Aceh Besar. The research method used in this study is to use a quasi-experimental method with pre-test and post-test control group design. Samples were taken from class VIII-4 as an experimental class and class VIII-3 as a control class. Data collection is done by tests and questionnaires. Based on the results of hypothesis testing that has been done, using the t test with a significant level  $\alpha = 0.05$  and  $dk = 38$ . The calculation results obtained  $t_{count} > t_{table}$  is  $3.31 > 1.68$ , Based on t test then  $t_{count} > t_{Table}$ , then  $H_a$  accepted and  $H_0$  rejected, which states that the influence of the use of comic media to improve cognitive and affective learning outcomes of students in the subject of straight motion in class VIII SMP Negeri 1 DarulImarah Aceh Besar and the response of students Very Agree (SS = 58%), Agree (S = 37.5%), Less Agree (KS = 3%), Disagree (TS = 1%), and Strongly Disagree (STS = 0.5%).

## 1. Introduction

The world of education in Indonesia is currently very weak, one of which is in science education, where the main factor that inhibits the success of students in learning science is the lack of an interesting touch from educators in explaining science so that it creates a sense of disinterest in learning science. The second factor is the lack of seriousness of students in learning so students are difficult to understand what is explained by educators. The third factor is the lack of experimentation in teaching can also hinder the achievement of student learning outcomes, because experiments in science education are very important, so that experiments cannot be separated from the world of science.

Physics is a branch of natural science. But in fact that science is one of the subjects that require mathematical ability to solve problems and analyze theories. In general, students with low mathematical abilities will have difficulty understanding concepts and theories in physics. Characteristics Physics is basically the same as the characteristics of science in general, but in learning physics is inseparable from the mastery of the basic concepts of physics.

In a learning process, a good learning achievement is needed, one of which is by using learning media that can attract the attention of students. Learning media is something that can be used to convey messages or information in the teaching and learning process so that it can stimulate students' attention in learning.

Based on some of the opinions above, we need a learning media to improve student learning outcomes, one of the learning media that can be applied is comic media, where comic media is a teaching material whose contents are learning in the form of summaries so as to attract students to read. So the existence of comic media based learning media is expected to improve students' cognitive and affective learning outcomes on straight motion material.

Based on observations and interviews in the field, the researchers saw that most students at SMPN 1 Darulmarah Aceh Besar school tended to like subjects without mathematical analysis, one of which was artistry, at the time of observation there were even students who came out of class to make artwork and chose not to enter science subjects because according to the students that science is very complicated. Student learning outcomes have also not yet reached the KKM (Minimum Completeness Criteria), especially for straight-motion material and learning processes that are centered only on books making students bored and fed up because books are only filled with texts and formulas.

Learning is an activity carried out by a person intentionally in a conscious state to obtain a concept, understanding, or new knowledge to enable a person to change behavior that is relatively fixed both in thinking, feeling, and in acting. Learning is the process of interaction between students and educators in a learning environment that aims to provide information from educators to students to obtain changes in behavior and potential of students.

Learning outcomes are the results obtained by students after following the teaching and learning process. Appearances that can be observed as learning outcomes are called abilities. These abilities are owned by students after receiving learning experiences in the learning process. The word media comes from the Latin *medius* which literally means 'middle', 'intermediary', or 'introduction'. In Arabic the media is an intermediary or introduction to the message from the sender to the recipient of the message.

Comic is a cartoon that expresses a character and plays a story in a tight order and is a form of picture news, consisting of various situations and sometimes humorous. Comics are one of the media photos or images that are suitable and appropriate to be applied in learning. Comics are defined as cartoonish forms that express characters and apply a story in a sequence that is closely related to the image and is designed to provide entertainment to the reader. This study aims to determine how the effect of the application of comic media can improve cognitive and affective learning outcomes of students in the subject of straight motion in class VIII of SMPN 1 Darulmarah Aceh Besar.

## 2. Methods

The research design used was a quasi-experimental research method (Quasi Experiment), with Pre-test and *Post test* Control Group Design. This research involves two classes, namely the experimental class and the control class, in both classes will be given different treatments. The experimental class will be treated by teaching using comic media, while in the control class the educator does not apply comic media. The research design is as follows on Table 1.

**Table 1.** Pre testPost test Control Group Design

Group	Initial Test	Treatment	Final Test
Experiment (E)	O <sub>1</sub>	X	O <sub>2</sub>
Group (K)	O <sub>1</sub>	-	O <sub>2</sub>

Where O<sub>1</sub> is giving a pre-test, O<sub>2</sub> is giving a final test (post test) and X is learning with comic media.

**Data collection technique**

The data collection techniques used in this study are tests and questionnaires. For data collection tests in the form of written tests namely multiple choice questions (Multiple Choice), while the questionnaire is used to see the response of students to the media applied in learning.

**Data analysis technique**

*Normality Test*

Test the normality of the data first made into the distribution list then calculated the average variance and standard deviation. To test the normality of the sample, the formula used is.

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i} \tag{1}$$

where  $\chi^2$  is the Chi-Square statistic, the frequency of observation  $O_i$  is the expected frequency and  $K$  is a lot of data.

*Variance Homogeneity Test*

The function of variance homogeneity is to find out whether this sample succeeds with the same variance, so the results of this study apply to the population, the formula used in this test are:

$$F = \frac{S_1^2}{S_2^2} \tag{2}$$

where  $S_1^2$  is the variance of the interval class value and  $S_2^2$  is the variance of group class.

*Testing the Hypothesis*

To test the hypotheses that have been formulated about the differences in learning outcomes of students taught with comic media and students taught without using comic media, the following formula can be used:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \tag{3}$$

where  $t$  is the number of students in the experimental class,  $n_1$  is the number of students in the control class,  $\bar{x}_1$  is the average value in the experimental class,  $\bar{x}_2$  is the average value in the control class,  $s$  is the deviation is not a calculated value.

*Student Questionnaire Analysis Analysis*

The questionnaire used in this study took the form of a Likert scale where students gave a response to the response statements by selecting:

- SS : Very agree
- S : Agree
- KS : Not agree
- TS : Disagree
- STS : Strongly Disagree

Student responses are used to measure students' opinions on interests, feelings of pleasure, and ease of understanding the lesson and also the way the teacher teaches and the learning approach used. To analyze student questionnaire data is done by calculating the percentage of relative frequency with the formula:

$$P = \frac{f \cdot x}{N} \cdot 100\%, \tag{4}$$

where P is the percentage number, f is the frequency of the number of students' responses in each aspect that appears, N is the total number of students and 100% is a constant value.

The percentage criteria for student responses are as follows:

- 0-10% = not interested
- 11-40% = a little interested
- 41-60% = quite interested
- 61-90% = interested
- 91-100% = very interested.

### 3. Research Results and Discussion

#### Normality Test

##### Pre-test Experiment Class

Based on the results of the study, the highest and lowest order values can be seen in the Table 2.

**Table 2.** Sequence of the Highest and Lowest grade Experiments

<b>EksperimENTS</b>	<b>Pre-test</b>
The highest score	60
Lowest Value	15
SD	13,18
N	20

Based on Table 2 it can be seen that the highest pre-test value of the experimental class is 60 and the lowest value is 15 while the highest *post test* value is 90 and the lowest is 60 with a total of 20 students. After obtaining the above value, the next step is to determine the frequency distribution of the experimental class's *pre-test* value. The details can be seen in Table 3.

**Table 3.** Frequency distribution of student's pre-test student's pre-test value.

<b>Test scores</b>	<b>Frequency (f<sub>i</sub>)</b>	<b>The midpoint (x<sub>i</sub>)</b>	<b>x<sub>i</sub><sup>2</sup></b>	<b>f<sub>i</sub> x<sub>i</sub></b>	<b>f<sub>i</sub> x<sub>i</sub><sup>2</sup></b>
15-23	5	19	361	95	1805
24-32	6	28	784	168	4704
33-41	5	37	1369	185	6845
42-50	1	46	2116	46	2116
51-59	2	55	3025	110	6050
60-68	1	64	4096	64	4096
<b>Totals</b>				<b>668</b>	<b>25616</b>

Based on Table 3 it is clear that the result of  $X^2_{count}$  is 4.34 the test is carried out at a significant level of 95% or ( $\alpha = 0.05$ ) and degrees of freedom  $dk = n - 1 = 20 - 1 = 19$  then from the chi-square table obtained  $X^2(0.95)(19) = 30.1$ . To test the normality of the data obtained  $X^2_{count} < X^2_{table}$   $4.34 < 30.1$ , it can be concluded that the data are normally distributed. The details can be seen in Table 4.

**Table 4.** Calculation results for *pre-test* normality test for experimental classes.

<b>a</b>	<b>Many Students</b>	<b>X</b>	<b>T</b>	<b>Conclusion</b>
0,05	20	4,34	30,1	Normal

**Post test Experiment Class**

Based on the results of the study, the highest and lowest order values can be seen in the table below.

**Table 5.** Sequence of highest and lowest *post test* experiment classes.

<b>Exsperiment</b>	<b>Post test</b>
The highest score	90
Lowest Value	45
SD	13,25
N	20

Based on Table 5 it can be seen that the highest *post test* value of the experimental class is 90 and the lowest value of 44. After obtaining the above value, the next step is to determine the frequency distribution of the experimental class's *post test* value. The details can be seen in Table 6.

**Table 6.** Frequency distribution of *post test* student value in experimental classes.

<b>Test scores</b>	<b>Frequency (f<sub>i</sub>)</b>	<b>The midpoint (x<sub>i</sub>)</b>	<b>x<sub>i</sub><sup>2</sup></b>	<b>f<sub>i</sub> x<sub>i</sub></b>	<b>f<sub>i</sub> x<sub>i</sub><sup>2</sup></b>
45-53	1	58	2401	49	2401
54-62	2	65	3364	116	6728
63-71	3	72	4489	201	13467
72-80	4	79	5776	304	23104
81-89	6	86	7225	510	43350
90-98	4	94	8836	376	35344
<b>Total</b>	<b>20</b>			<b>668</b>	<b>124394</b>

Based on Table 6 it is clearly seen that the calculation result of  $X^2_{count}$  is 3.96 testing done at a significant level of 95% or ( $\alpha = 0.05$ ) and degrees of freedom  $dk = n - 1 = 20 - 1 = 19$  then from the chi-square table obtained  $X^2(0.95) (19) = 30.1$ . To test the normality of the data obtained  $X^2_{count} < X^2_{table}$   $3.96 < 30.1$ , it can be concluded that the data are normally distributed. The details can be seen in Table 7.

**Table 7.** Calculation results for the *post-test* normality test for experimental classes

<b>a</b>	<b>Number of Students</b>	<b>X<sub>count</sub></b>	<b>T<sub>table</sub></b>	<b>Conclusion</b>
0,05	20	3,96	30,1	Normal

**Pre-test control Class**

**Table 8.** Sequence of the highest and lowest *pre-test* control classes.

<b>Experiment</b>	<b>Pre-test</b>
The highest score	60
Lowest Value	15
SD	12,93
N	20

Based on Table 8 it can be seen that the highest *pre-test* value of the control class is 60 and the lowest value is 15 with the number of students 20 people. After the above values are obtained, the next step is to determine the frequency distribution of the control class *pre-test* values. The details can be seen in Table 9.

**Table 9.** Frequency distribution of pre-test value of students in control class.

Test scores	Frequency ( $f_i$ )	The midpoint ( $x_i$ )	$x_i^2$	$f_i x_i$	$f_i x_i^2$
15-23	8	19	361	361	2888
24-32	6	28	784	28	4704
33-41	3	37	1369	37	4107
42-50	1	46	2116	46	2116
51-59	1	55	3025	55	3025
60-68	1	64	4096	64	4096
<b>Amount</b>				<b>668</b>	<b>20936</b>

Based on Table 9, it can be clearly seen that the calculation result of  $X^2_{count}$  is 16.43, the test is carried out at a significant level of 95% or ( $\alpha = 0.05$ ) and degrees of freedom  $dk = n - 1 = 20 - 1 = 19$  then from the chi-square table we get  $X^2(0.95)(19) = 30.1$ . To test the normality of the data obtained  $X^2_{count} < X^2_{table}$   $16.43 < 30.1$ , it can be concluded that the data are normally distributed. The details can be seen in Table 10.

**Table 10.** Results of pre-test normality control class calculation results.

$\alpha$	Many Students	$X_{count}$	$T_{table}$	Conclusion
0,05	20	16,43	30,1	Normal

**Post test Control Class**

Class Based on the results of the study, the highest and lowest order values can be seen in the table below.

**Table 11**Sequence of the Highest and Lowest *Post test* Control Class *Post test*

Eksperimen	<i>Post test</i>
The highest score	85
Lowest Value	40
SD	11,15
N	20

Based on Table 11 it can be seen that the highest post test value of the control class is 85 and the lowest value is 40. After the above values are obtained, the next step is to determine the frequency distribution of the *post test* scores of the control class. The details can be seen in Table 12.

**Table 12.**Frequency distribution of post test value of students in the control class

Test scores	Frequency ( $f_i$ )	The midpoint ( $x_i$ )	$x_i^2$	$f_i x_i$	$f_i x_i^2$
45-53	3	58	2401	147	7203
54-62	6	65	3364	348	20184
63-71	5	72	4489	335	22445
72-80	4	79	5776	304	23104
81-89	2	86	7225	170	14450
<b>Amount</b>	<b>20</b>			<b>1304</b>	<b>87386</b>

Based on Table12 it is clear that the calculation result of  $X^2_{count}$  is 3.55 testing done at a significant level of 95% or ( $\alpha = 0.05$ ) and degrees of freedom  $dk = n - 1 = 20 - 1 = 19$  then from the chi-square table obtained  $X^2(0.95)(19) = 30.1$ . To test the normality of the data obtained  $X^2_{count} < X^2_{table}$   $3.55 < 30.1$ , it can be concluded that the data are normally distributed. The details can be seen in Table 13.

**Table 13.** Calculation results for the control class post test normality test.

a	Many Students	$X_{count}$	$T_{table}$	conclusion
0,05	20	3,55	30,1	Normal

**Homogeneity test**  
**Homogeneity Test Pre-test**

**Table 14.** Calculation results for pre-test homogeneity test for experiment classes and control classes.

a	Many Students (n)	Varian ( $S^2$ )	$F_{Hitung}$	$F_{Tabel}$	Conclusion
		Eksperimen			
0,05	20	173,93	1,04	2,15	Kedua data homogen
a	BanyakPesertaDidik (n)	Kontrol			
0,05	20	167,11			

Based on the above table, it is clear that  $F_{count} \leq F_{table}$  or  $1.04 \leq 2.15$ , it can be concluded that the two variances are homogeneous for the *Pre-test* value data.

**Homogeneity Test Post test**

**Table 15** Calculation results for *post test* homogeneity test for experiment classes and control classes.

a	Many Students (n)	Varian ( $S^2$ )	$F_{Hitung}$	$F_{Tabel}$	Conclusion
		Eksperimen			
0,05	20	175,64	1,04	2,15	Kedua data homogen
a	BanyakPesertaDidik (n)	Kontrol			
0,05	20	124,48			

Based on the above table, it is clear that  $F_{count} \leq F_{table}$  or  $1.04 \leq 2.15$ , it can be concluded that the two variances are homogeneous for the *Post test* value data.

**Hypothesis Statistics**

used to test hypotheses are t-tests, with the formulation of hypotheses used are as follows:  $H_0: \mu_1 = \mu_2$   $H_a: \mu_1 > \mu_2$  Where:  $H_0$ : That there is no influence of the application of comic media to improve cognitive and affective learning outcomes of students on the subject of straight motion in class VIII SMPN 1 DarulImarah Aceh Besar.  $H_a$ : That the influence of the application of comic media to improve results cognitive and affective learning of students in the subject of straight motion in class VIII SMPN 1 DarulImarah Aceh Besar. Results Hypothesis testing in this study uses students' post test data. Tests carried out at a significant level  $\alpha = 0.05$  with degrees of freedom  $dk = (n_1 + n_2 - 2)$ ,  $dk = 20 = 20 - 2 = 38$  with the results obtained  $t_{count} = 3.31 > t_{table} = 1.68$ . Based on the t test,  $t_{count} > t_{table}$ , then  $H_1$  is accepted and  $H_0$  is rejected, which states that there is an influence of the use of comic media to improve cognitive and affective learning outcomes of students on straight motion material in class VIII of SMP Negeri 1 DarulImarah Aceh Besar.

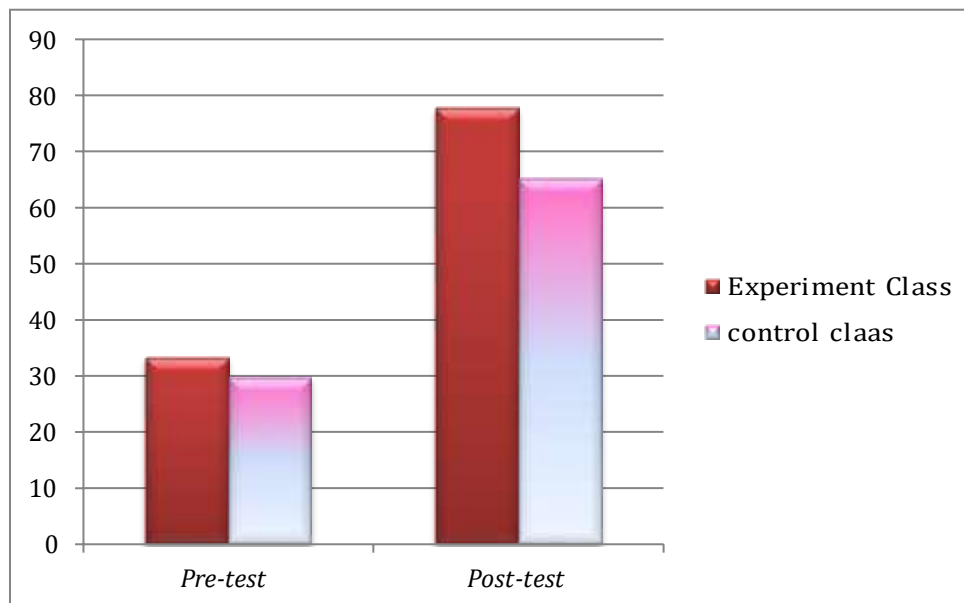
**Analysis of Student Response Data**

Students' responses are used to find out how students' responses to learning using comic media, therefore educators distribute questionnaires to students in class VIII-4. Students' responses in class VIII-4 are filled by 20 students. From these data calculations are carried out, so we get the results of the students' responses which can be seen in detail in the Table below.

**Table 16.** Results of class viii-4 students' responses.

	Respon					Persentase				
	SS	S	KS	TS	STS	SS	S	KS	TS	STS
Jumlah	116	65	6	2	1	580%	375%	30%	10%	5%
Rata-rata	5,8	3,25	0,3	0,1	0,05	58%	37,5%	3%	1%	0,5%

Based on the table above the results obtained by students' responses with the average percentage as follows: Criteria Strongly Agree (SS = 58%), Agree (S = 37.5%), Less Agree (KS = 3%), Disagree (TS = 1%), and Strongly Disagree (STS = 0.5%), it can be concluded that the use of comic media on the material of straight motion in SMP Negeri 1 DarulImarah Aceh Besar received a positive response. Based on the results of data processing obtained by researchers, the analysis of data obtained through pre-test, with an average value of 33.4 experimental classes while the average value of the control class 29.8. This shows that the two homogeneous classes are the same before treatment, so that further research can be done, namely in the experimental class the comic media is applied, whereas in the control class only with conventional learning. After the treatment, the average post test value of the experimental class rose to 77.8, while the average post test value of the control class rose to 65.2. This can be seen in the Figure 1.



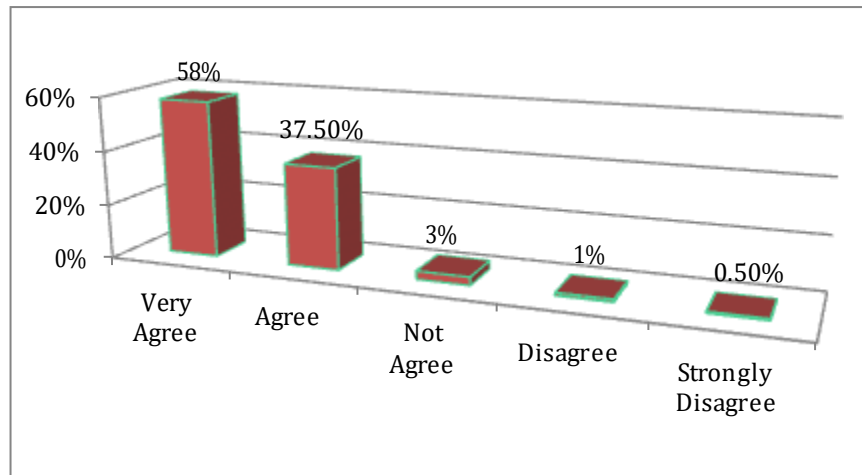
**Figure 1.** Graph of learning outcomes of students in the experiment class and control class

Based on the graph on figure 1 shows that there is an increase in student learning outcomes using comic media, in the experimental class that is from 33.4 to 77.8 with an average value of 44.4, while in the control class that is the class that does not use comic media, namely from 29.8 to 65.2 with an average value of 44.4. From the results of the study it can be seen that the use of comic media can improve student learning outcomes on straight motion material.

**Analysis of Student Responses**

After learning to use comic media, to see students' responses, educators circulate a questionnaire, where this questionnaire aims to see students' responses to the use of comic media. The results of students' responses can be seen in Figure 4.2 in the form of a graph 2.





**Figure 2.** Student response.

Based on the graph figure 2, it appears that the use of comic media on straight motion material received a positive response from students with an average percentage of criteria Strongly Agree (SS = 58%), Agree (S = 37.50%), Less Agree (S = 30 %), Disagree (TS = 3%), and Strongly Disagree (STS = 0.50%) Based on the results of research and data processing through questionnaires, the percentage shows that the response of students is positive.

Based on the results of research conducted by researchers shows that the data obtained has increased in the experimental class, the increase occurred because comic media can attract the enthusiasm of students and increase interest in reading so that the experimental class has increased learning outcomes.

The results of previous studies indicate that the comic media has an influence on the learning outcomes of Grade VIII students of SMP Negeri 1 Gedangan. This is indicated by the high test scores of the experimental class using learning comic media compared to the control group test scores that do not use learning comic media. The learning comic media is considered to be a new motivation in improving student learning outcomes. This is consistent with the theory put forward by Sudjana and Rivai which mentions among other things the benefits of learning media in the learning process of students that is, can foster student motivation because teaching will be more interesting, so that students can understand and allow mastery and achievement of teaching goals.

#### 4. Conclusion

Based on the purpose of research on the application of comic media to improve cognitive and affective learning outcomes of students on straight motion material it can be concluded that the use of comic media on straight motion material has an effect on increasing student learning outcomes. This is evidenced from the average value of the experimental class pre-test 33.4, and after the implementation of comic media in learning the average value of the experimental class *post test* to 77.8, and strengthened with the results of the hypothesis test that shows the value of  $t$  that is 3, 31 > 1.68 for the significant level of 95% and  $\alpha = 0.05$  so it is accepted.

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