



## Enhancing Student's Interest in Learning and Science Problem-Solving Skills through Educational Comics

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### ABSTRAK

Siswa masih mengalami kesulitan dalam mengembangkan minat belajar dan kemampuan memecahkan masalah IPA. Hal tersebut berdampak pada siswa menjadi kesulitan bekerja dalam kelompok, berkomunikasi, memecahkan masalah, dan membuat keputusan sebagai solusi yang tepat untuk suatu permasalahan. Tujuan penelitian ini yakni (1) untuk menganalisis ada tidaknya perbedaan minat belajar dan kemampuan pemecahan masalah IPA siswa pada siswa yang menggunakan komik edukatif dengan siswa yang tidak menggunakan komik edukatif (2) untuk menganalisis ada tidaknya pengaruh komik edukatif terhadap peningkatan minat belajar dan kemampuan memecahkan masalah IPA pada siswa. Penelitian ini diharapkan dapat memberikan data tentang penggunaan komik dalam meningkatkan kemampuan pemecahan masalah dan minat belajar siswa. dilaksanakan di Kapanewon Danurejan dengan subjek penelitian berupa siswa kelas 5 SD se-Kapanewon Danurejan. Penelitian ini menggunakan desain quasi eksperimen dengan pretest-posttest control design. Metode pengumpulan data menggunakan instrumen penelitian berupa angket dan tes. Teknik analisis data yang digunakan adalah analisis deskriptif kuantitatif. Berdasarkan pengujian hipotesis yang diperoleh yaitu melalui perhitungan independent t-test dengan taraf signifikan ( $\alpha$ ) 0.05 didapatkan nilai signifikansi sebesar 0.000 dan paired sample t-test dengan taraf signifikan ( $\alpha$ ) 0.05 didapatkan nilai signifikansi sebesar 0.000. Dengan demikian dapat disimpulkan bahwa terdapat perbedaan minat belajar maupun kemampuan pemecahan masalah IPA antara siswa yang menggunakan komik edukatif dengan siswa yang tidak menggunakan komik edukatif, komik edukatif juga berpengaruh terhadap peningkatan minat belajar dan kemampuan pemecahan masalah IPA siswa kelas 5 SD di Kapanewon Danurejan.

### ABSTRACT

Students still have difficulties in developing their interest in learning and the ability to solve science problems. This has an impact on students having difficulty working in groups, communicating, solving problems, and making decisions as the right solution to a problem. The objectives of this study are (1) to analyze whether there is a difference in learning interest and science problem-solving ability of students who use educational comics and students who do not use educational comics (2) to analyze the influence of educational comics on the increase in learning interest and science problem-solving ability in students. This research is expected to provide data about the use of comics in improving students' problem-solving abilities and interest in learning. This research was carried out with the research subject in the form of 5th grade elementary school students. This study uses a quasi-experimental design with a pretest-posttest control design. The data collection method uses research instruments in the form of questionnaires and tests. The data analysis technique used is quantitative descriptive analysis. Based on the hypothesis test, the independent t-test with a significant level ( $\alpha$ ) of 0.05 obtained a significance value of 0.000 and the paired sample t-test with a significance level of ( $\alpha$ ) 0.05 obtained a significance value of 0.000. Thus, it can be concluded that there is a difference in learning interest and science problem-solving ability between students who use educational comics and students who do not use educational comics, educational comics also affect the increase in learning interest and science problem-solving skills of 5th grade elementary school students.

## 1. INTRODUCTION

The achievement that students must master in learning science material is being able to understand, observe, analyze and solve problems. These achievements are things that students must achieve during the learning process (Abdullah et al., 2015; Lucenario et al., 2016). In achieving all learning outcomes in science, students must have a high interest in learning. Therefore, increasing students' interest in learning science material is very important. High interest in learning makes students excited to learn the material given (Nouri, 2016; Puspitarini & Hanif, 2019). The increase in interest in learning is directly proportional to the increase in student learning outcomes. Learning outcomes can be a parameter for students in developing their abilities in science material, for example in problem-solving skills. In addition to learning interests, one of the skills that is important for students is their ability to solve problems. The ability to solve problems can make students apply their knowledge in overcoming situations faced in their daily lives (Chiang & Lee, 2016; Erlangga, 2022). Learning science requires problem-solving skills and can even be said to be a basic need (Khoiriyah & Husamah, 2018; Vieira & Tenreiro-Vieira, 2016). Theoretically, learning science makes it easier for students to solve problems and build their own knowledge. That way, students can become active learning subjects who can build their knowledge independently. Science is a learning that is close to students, namely in the surrounding environment. However, the results of initial observations in Kapanewon Danurejan, Yogyakarta City show that science learning is a learning that is still not in demand. Initial observations were made in elementary schools including SDN Lempuyangwangi, SDN Lempuyangan 1, SD Muhammadiyah Bausasran 1 and SD Muhammadiyah 2. The data shows that students' interest in learning and problem-solving skills in science learning are still lacking.

Ideally, science learning in elementary school is used as a forum for students to develop their abilities and potential. These abilities and potentials include process skills, observation, independent work habits, honesty, discipline, having a good social attitude, community life skills, and problem-solving skills (Al Mamun et al., 2022; Fisher et al., 2017). The above problems are supported by test results that show that students' problem-solving skills are still low in Science subjects. In addition, other problems that exist based on the results of the preliminary study are regarding the interest in learning and problem-solving skills of elementary school students in Kapanewon Danurejan. One of the factors that affect these problems is (1) Learning is carried out in a monotonous manner and teachers rarely conduct experiments outside the classroom; (2) Teachers still apply the lecture method and give assignments that focus on conceptual problems in learning; (3) Teachers have limitations in utilizing the learning resources available at school; (4) Teachers' limitations in developing the required teaching materials (5) Teachers' limited time to develop new teaching materials; and (6) There are no interesting modified teaching materials other than those available such as guidebooks and teaching modules.

Interesting teaching materials can not only increase interest in learning science, but can also help improve science problem-solving skills. This was revealed by many students who thought that science was one of the learning that was difficult to learn without the help of teaching materials (Puspitarini & Hanif, 2019; Ridha et al., 2020). The right teaching materials are expected to help the process of student analysis of learning materials so as to create meaningful learning. Meaningful learning helps students to think more critically about the problems given (Al-Zahrani, 2015; Duran & Dökme, 2016). Several studies have shown that the use of interesting media, one of which is comics, has been proven to improve students' problem-solving abilities and learning interests. One study by previous study found that comics can improve creative thinking skills (Zarvianti & Sahida, 2020). Another study also proved that it can increase elementary school students' interest in learning science (Fatimah & Fatonah, 2023). In contrast to previous research, this research will focus on the variables of learning interest and the ability to solve science problems.

Theoretically, teaching materials can be used as an alternative innovation to develop learning (Eli, 2021; Haleem et al., 2022). This research will use educational comic teaching materials to increase interest in learning and science problem-solving skills. Comic-based teaching materials have a function as informative and educational teaching materials (Anggraeni et al., 2023; Rusmaini, 2023). In addition, comics have a uniqueness that is different from other teaching materials such as various color variations, there are conversations accompanied by characters and writing placed on conversation balloons (Alfianika & Marni, 2020; Bitz & Emejulu, 2016). Comics were chosen to foster interest in learning and improve students' problem-solving skills so that science learning is more interesting. Regarding the increase in learning interest that can be facilitated through the use of comics, this is because comics contain a variety of interesting images, characters, storylines and colors that can attract students' interest. This research aim to analyze how students are expected to have an interest in learning a material if the material is delivered in an unusual way such as through comic readings like this. The presentation of the comics is adapted to the environment and the illustrations are designed through simple images with an interesting story and the language is not rigid (Rina et al., 2020; Rosidah et al., 2022).

In science learning, it is hoped that students have a high interest in learning and problem-solving skills that can develop. Learning can be said to be effective if it has an interesting, relevant, and contextual strategy so that students can be actively involved in learning. This is in accordance with constructivist learning. One of the media that supports active learning so that it can increase learning interest and problem-solving skills is educational comics. Educational comics function as a tool that connects science content with everyday reality that reduces abstract scientific concepts (Lestari et al., 2021; Matuk et al., 2021). The impact is, with the existence of educational comics that are in accordance with students' reality, students are able to improve their understanding. Students will understand more if the visuals in the comics are presented in an interesting way. Mayer in his theory of multimedia learning emphasizes that the combination of images and texts that are integrated properly can improve students' cognitive processing and strengthen understanding of more complex concepts (Sayyadi et al., 2024; Vu et al., 2022).

However, in reality, there is still a gap between ideal conditions and learning practices that occur in many schools. Based on the results of researchers' observations in several schools in Yogyakarta City, students tend to show low interest in science learning. In addition, science learning is considered abstract and difficult to understand, thus affecting students' learning motivation. This is in line with El-Sabagh and Qureshi et al which states that students' learning interest is greatly influenced by the relevance of the material and the learning methods used (El-Sabagh, 2021; Qureshi et al., 2021).

In addition, students' problem-solving skills are not optimally developed. Not a few schools still apply teacher-centered learning models so that students do not get the opportunity to be active in exploring scientific concepts and solving problems. This model is often ineffective in developing science problem-solving skills. The existence of this gap creates an urgency to explore educational comics as a learning medium that can bridge students' needs. Educational comics are not only able to attract students' interest because of their visuals and narratives, but can also support problem-solving skills through interesting storylines so that students are able to solve problems in science learning. Therefore, this research aims to analyze how to increase students' interest in science subjects and problem-solving skills in the learning process on science materials. This research offers innovation in science learning by using educational comics as a medium to increase students' interest in learning and science problem solving skills. This educational comics approach combines engaging visuals and simple narrative to explain complex science concepts, allowing students to more easily understand and engage with the subject matter.

## 2. METHOD

The researcher used a quasi-experimental type of research. Quasi experiments or pseudo-experiments are carried out using two teams, namely the experimental and control teams. Nonequivalent comparison group design. Nonequivalent comparison group design is used to compare the experimental group and the control team and the samples are taken non-randomly (determined by the researcher). This study aims to determine the influence of educational comics on learning miantns and the ability to solve science problems in 5<sup>th</sup> grade elementary school students. This research was conducted in elementary schools throughout Kapanewon Danurejan, namely SD Negeri Lempuyangwangi, SD Negeri Lempuyangan 1, and SD Muhammadiyah Bausasran 1 & 2. The population was all 5<sup>th</sup> grade students totaling 106 students. The sample used was 59 students. The sampling technique used in this study was cluster random sampling. The variables in this study were learning interest and problem-solving ability as dependent variables.

This research was conducted by preparing a previously validated comic, namely Si Kodu. Data analysis began with descriptive analysis to provide a picture of data seen from the average value (mean), standard deviation, variance, maximum, minimum. The grid and indicators of learning interest and ability to understand science problems can be observed in Table 1 and Table 2.

**Table 1. Student Learning Interest Instrument Grid**

No	Indicator	No. Item	Total
1	Happy at Science Learning	1-15	15
2	Involvement in Science Learning		
3	Students Interest in Science		
4	Student Attention		

**Table 2. Instrument Grid of Students' Ability to Solve Science Problems**

No	Indicator	No. Item	Total
1	Understanding Known Issues	1-8	8
2	Plan Troubleshooting Solutions		

No	Indicator	No. Item	Total
3	Reslove Issues as Planned		
4	Conduct Troubleshooting Evaluations		

The grid of the two variables was then derived into a research instrument. The research instrument was tested for validity before being used in the research. The following are the results of the validity test of the learning interest and problem solving ability instruments for science as show in [Table 3](#).

**Table 3. Validity Test Result**

Variable	Questionnaire/Test	R <sub>table</sub>	R <sub>count</sub>	Result
Learning Interest	1	0.444	0.60065	Valid
	2	0.444	0.50443	Valid
	3	0.444	0.58567	Valid
	4	0.444	0.63855	Valid
	5	0.444	0.48372	Valid
	6	0.444	0.61255	Valid
	7	0.444	0.512	Valid
	8	0.444	0.49569	Valid
	9	0.444	0.54899	Valid
	10	0.444	0.67044	Valid
	11	0.444	0.58561	Valid
	12	0.444	0.44662	Valid
	13	0.444	0.14633	Drop
	14	0.444	0.47766	Valid
	15	0.444	0.49304	Valid
	16	0.444	0.46092	Valid
Problem Solving Skills	1	0.444	0.7435	Valid
	2	0.444	0.6721	Valid
	3	0.444	0.6721	Valid
	4	0.444	0.1885	Drop
	5	0.444	0.6721	Valid
	6	0.444	0.5499	Valid
	7	0.444	0.5259	Valid
	8	0.444	0.6599	Valid

Based on [Table 3](#), it is known that there are a number of invalid test/questionnaire items. Instrument items are said to be invalid if the calculated r is lower than the table r. Invalid instrument items are found in instrument item 13 in the learning interest variable and item 4 in the problem solving skills variable. Invalid instrument items are not used in this research instrument. Data were collected from observations and tests with observation sheet instruments and reading comprehension test instruments. The tests used are paired sample t-test and independent sample t-test on the condition that the data is normally distributed and homogeneous.

### 3. RESULT AND DISCUSSION

#### Result

Before presenting the results of inferential statistics on the influence of the educational comic Si Kodu on students' interest in learning science and their ability to solve science problems, the researcher presents the results of descriptive statistical analysis to describe the results of interest in learning science and their ability to solve science problems. The results of descriptive statistics in the experimental class and the control class is show in [Table 4](#).

**Table 4. Descriptive Statistics**

Variable	Group	Min	Max	Mean	Std. Deviaton	Var
Learning Interest	Control (Pretest)	26	59	41.79	8.19	67.09
	Control (Posttest)	30	58	45.45	6.99	48.94
	Experiment (Pretest)	25	49	37.56	5.90	34.89
	Experiment (Posttest)	53	75	65.17	5.57	31.10

Variable	Group	Min	Max	Mean	Std. Deviaton	Var
Problem Solving Skills	Control (Pretest)	50	72	60.32	5.27	27.85
	Control (Posttest)	60	79	68.50	4.78	22.88
	Experiment (Pretest)	50	76	62.52	6.12	34.47
	Experiment (Posttest)	52	75	62.58	6.27	39.39

Based on the data in Table 4, it is known that there is an increase in the average interest in learning students in the experimental group (the group that uses Sikodu Comics). The average interest in learning students increased from 37.56 during the pretest to 65.17 during the posttest. Likewise, the variable of students' problem-solving abilities in the experimental class. The average problem-solving ability of students increased from 62.52 during the pretest to 62.58 during the posttest. Based on these results, it is known that there is an increase in students' interest in learning and problem-solving abilities in students who use Sikodu comics in learning. However, these results need to be strengthened by inferential statistical analysis which will be explained as follows.

**Normality Test**

The normality test of learning and science problem-solving ability was carried out using the Kolmogorov-Smirnov test. The data is said to be normally distributed if it has a significance of >0.05. The results of the normality test of students' interest in learning and science problem-solving ability in the control class as well as experiments during pre and after treatment is show in Table 5.

**Table 5. Normality Test Results**

Variable	Group	Type	Sig	Result
Interest in Learning	Control	Pretest	0.200	Normal
		Posttest	0.200	
	Experiment	Pretest	0.200	
		Posttest	0.072	
Science Problem-Solving Skills	Control	Pretest	0.180	
		Posttest	0.198	
	Experiment	Pretest	0.062	
		Posttest	0.200	

Based on the data of Table 5, it can be said that the variables of learning interest and science problem-solving ability in the experimental and control groups are normally distributed because the significance value obtained is greater than 0.05 .

**Homogeneity Test**

The data that has been distributed normally is then tested for homogeneity. The homogeneity test uses the Levene Test. The data is stated to be homogeneous if the significance < 0.05. The results of the homogeneity test of learning interest variables and science problem-solving ability in the experimental and control classes can be observed in Table 6.

**Table 6. Homogeneity Test Results**

Variable	Levene's test	Sig	Result
Interest in Learning	Based on Mean	0.141	Homogenous
Science Problem-Solving Skills		0.278	

Base on Table 6, the results of the homogeneity test on the learning interest variable were declared homogeneous because the significance value > 0.05 was 0.278 > 0.05. The variable of science problem-solving ability based on the test results showed that the data was declared homogeneous because the significance value (based on mean) had a value of more than 0.05 ( $\alpha > 0.05$ ), namely 0.141 > 0.05. Based on these results, it was stated that the two variables in this study were declared homogeneous.

**Independent t-test**

The independent t-test was carried out after confirming that the prerequisite test had been met. Science Problem-Solving Skills were carried out to determine whether there was a difference in each



variable, namely learning interest and science problem-solving ability between the control class and the experiment. The results of the Independent t-test can be seen in [Table 7](#).

**Table 7. Independent T Test Results**

Variable	Group	Type	Sig
Interest in Learning	Control	Posttest	0.000
	Experiment	Posttest	
Science Problem-Solving Skills	Control	Posttest	0.000
	Experiment	Posttest	

Based on the data in [Table 7](#), it can be said that there is a difference in the problem-solving ability of science and the learning interest of students who use educational comics and students who do not use educational comics because the results of the Independent T Test on each variable get a significance value of  $< 0.05$ .

**Paired Sample T-Test**

The paired t-test was carried out to determine whether there was a difference between the bound variables, namely the ability to solve science problems and the interest in learning in the pre- and post-experimental classes using Si Kodu comics. The hypothesis is tested especially for the variable of science problem-solving ability. Here are the results of the paired sample t-test as show in [Table 8](#).

**Table 8. Paired Sample T-Test Result**

Variabel	Group	Type	Sig
Interest in Learning	Experiment	Pretest	0.000
		Posttest	
Science Problem-Solving Skills	Experiment	Pretest	0.000
		Posttest	

Based on the data of [Table 8](#) it can be said that there is a difference between the pretest and posttest variables in the variables of science problem-solving ability and the learning interest of students who use educational comics because the results of the Dependent t-test on each variable get a significance value of  $< 0.05$ .

**N Gain Test**

After the t-test, the variables of learning interest and science problem-solving ability were then tested n gain. The n gain test was carried out to measure the amount of increase in pretest to posttest scores in the experimental and control classes. [Table 9](#) show the results of the n gain test on the variables of learning interest and science problem-solving ability.

**Table 9. N Gain Test Results**

	Interest in Learning		Science Problem-Solving Skill	
	Experiment Group	Control Group	Experiment Group	Control Group
	N Gain Score (%)	N Gain Score (%)	N Gain Score (%)	N Gain Score (%)
Average	73.3410	4.5161	53.5326	19.1883
Min	34.48	-109.52	0.000	-11.11
Max	100.00	54.35	81.58	52.17
Category	High	Low	Middle	Low

Based on [Table 9](#) the results of the N gain test on the variable of learning interest in the experimental class, the average was 73.3410. This shows that the experimental class is included in the high category. From these results, the conclusion is that the score is included in the interpretation of the "effective" category. As for the average N gain score in the control class, which is 4.5161 which is included in the low score category with the category of ineffective interpretation. From these results, the conclusion is that the experimental class that uses educational comics is more effective in increasing students' interest in learning.

Meanwhile, the variable of science problem-solving ability in the experimental class has an average of 53.5326. This shows that the experimental class is included in the medium category. From these results,

the conclusion is that the score is included in the interpretation of the "effective" category. As for the average N gain score in the control class, which is 19.1883 which is included in the low score category with the category of ineffective interpretation. From these results, the conclusion is that the experimental class that uses educational comics is more effective in increasing students' interest in learning.

## Discussion

This study revealed that there was a significant difference in science learning interest between the group of students who used educational comics and the group of students who did not use educational comics. The results of the independent sample t-test showed a significance value of 0.000, which indicates a very significant difference between the two groups. Students who use educational comics as a learning medium show higher interest in learning compared to students who use conventional methods. This is due to the ability of educational comics to present science material in an attractive and easy-to-understand manner, so that it can increase students' interest and motivation to learn. This significant difference in learning interests can be explained through the characteristics of educational comics that combine visual and narrative elements. Interesting illustrations and relevant storylines help students to better understand and remember the science concepts taught (Kao et al., 2016; Walan, 2019). In addition, educational comics also provide a more interactive and fun learning experience, so students feel more involved in the learning process (İlhan et al., 2021; Şahin & Kara, 2022). The results obtained are also in line with research by Fatimah & Fatonah and Surya et al which also show that comic media does have an influence on students' motivation and desire to learn because comics can make learning more enjoyable (Fatimah & Fatonah, 2023; Surya et al., 2020).

The next finding was that there was a significant difference in science problem-solving ability between the group of students who used educational comics and the group of students who did not use educational comics. The results of the independent sample t-test produced a significance value of 0.000, which indicates that the difference is very significant. The group of students who used educational comics showed a higher increase in problem-solving skills compared to the group that used conventional methods. This is due to the presentation of material in interesting and interactive educational comics, which is able to increase students' understanding of science concepts in a more in-depth and applicable way. This difference in problem-solving ability can be explained through the characteristics of educational comics that combine visual and narrative elements in learning. By using clear illustrations and contextual stories, educational comics help students to relate theories to real situations, making it easier for them to apply science concepts to solve problems (Praptiwi et al., 2021; Strouse et al., 2018). In addition, educational comics make the learning process more enjoyable and motivate students to be more actively involved in learning (Şahin & Kara, 2022; Silva et al., 2017). These results are in line with research by Suryatin & Sugiman and Muhlisin et al who also obtained the same results that comic media can improve problem-solving skills because comics are a practical and enjoyable learning medium when used in learning (Muhlisin et al., 2023; Suryatin & Sugiman, 2019). In addition, in comics there are steps to solving problems such as problem formulation, problem solving planning, problem solving, and reviewing the results of problem solving.

The results of the study showed that educational comics had a significant influence on increasing students' interest in learning in science subjects. Based on the paired sample t-test, a significance value of 0.000 was obtained, which indicates that there is a very significant difference between students' learning interest before and after using educational comics. This shows that the use of educational comics as a learning medium is able to effectively increase students' interest in learning science. High interest in learning is closely related to students' intrinsic motivation in exploring and understanding subject matter (Keller et al., 2017; Wigfield & Eccles, 2020). Educational comics, with their engaging visual and narrative elements, are able to create a fun and more engaging learning experience for students (Matuk et al., 2021; Şahin & Kara, 2022). Interesting illustrations, easy-to-understand dialogues, and storylines that are relevant to daily life make students more interested and motivated to learn science. Educational comics also not only function as teaching aids, but also as a catalyst to increase students' interest in learning. In addition, increasing interest in learning through educational comics also contributes to better student academic achievement (İlhan et al., 2021; Murti et al., 2020). When students have a high interest, they tend to be more active in the learning process, more persistent in facing challenges, and more creative in finding solutions to the problems they face (Bawa, 2016; Sithole et al., 2017). This shows that educational comics can be one of the effective strategies in an effort to improve the quality of education, especially in science subjects.

Educational comics have been proven to be able to significantly improve students' science problem-solving skills. The results of the paired sample t-test showed a significance value of 0.000, which indicated that there was a significant difference in problem-solving ability before and after the use of educational comics. This means that there is a noticeable improvement in students' abilities after they get the material

through educational comics. Engaging visualizations and narratives that include story elements in comics make it easier for students to understand complex and abstract science concepts (Matuk et al., 2021; Williams, 2019). By utilizing images, dialogue, and storylines, educational comics are able to attract students' interest and making them more enthusiastic in studying science. This is especially important because high interest can increase motivation to learn, which in turn contributes to a better understanding of the material. By understanding science concepts through the context of relevant and interesting stories, students can apply their knowledge in problem-solving more effectively and creatively (Ahmadi et al., 2021; Rina et al., 2020). These findings also emphasize the importance of innovation in learning methods. Educational comics, as a form of creative learning, not only improve students' cognitive abilities, but also help them in developing critical thinking and analytical skills. These skills are essential in science problem-solving.

This study is limited to elementary school comic media. In addition, this comic is also limited to water cycle material only. So that the increase in problem-solving skills and learning interest cannot be generalized to all age levels and other materials. Researchers hope that further researchers can use more complex media so that the results obtained can be more generalized. Based on these findings, it is recommended that schools and educators integrate educational comics in the science learning curriculum to increase students' interest and problem-solving skills. In addition, further development of educational comic-based teaching materials needs to be encouraged to cover various topics and levels of difficulty, so that it can provide broader and deeper benefits for students at various levels of education.

The results of this study provide an opportunity for curriculum developers and teachers to adopt educational comics as an innovative method in learning, especially science subjects that are often considered difficult to understand and less interesting according to students. The results of this study also enrich the literature on the use of visual media to improve learning outcomes, especially problem-solving skills. The results of this study can also encourage other researchers to conduct broader and deeper exploration of various other visual media, such as animation and educational games in improving students' problem-solving skills and learning interests.

#### 4. CONCLUSION

The results of this study show that the use of educational comics has a significant positive impact on students' interest in learning and science problem-solving skills. First, there is a significant difference in the learning interests of students who use educational comics. Second, there is a significant difference in the problem-solving ability of students who use educational comics. Third, students who use educational comics show an increase in interest in learning. Fourth, the group of students who use educational comics has improved science problem-solving skills.

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