

## The Use of Snakes and Ladder Game to Increase the Students' Interest in Learning Mathematics

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**Abstract.** *This research aims to increase students' interest in learning mathematics through the use of the snakes and ladders game in class V at SD 53 Banda Aceh. This research uses a quantitative approach, while the design used in this research is a Quasi Experimental Pretest-Posttest Control Group Design. Data was collected in this research by giving questionnaire questions to see students' interest in learning mathematics. Based on the analysis of the results of the questionnaire on students' interest in learning mathematics, pre-test and post-test scores, it was found that the normalized gain (N-Gain) of students' interest in learning mathematics had a value of Sig. (2-tailed) = 0.031. Because the Sig value. (2-tailed) < significance level ( $\alpha = 0.05$ ), so  $H_0$  is rejected and  $H_a$  is accepted. Thus, it can be concluded that there is a difference between the average N-Gain interest in learning mathematics for students who are taught using the snakes and ladders game and the average N-Gain interest in learning mathematics for students taught using conventional learning. If we look at the average N-Gain value of the experimental class and control class, it is found that the N-Gain value of the experimental class is higher than the control class, so it can be concluded that there is an increase in students' interest in learning mathematics which is taught through the use of the snakes and ladders game at SD 53 Banda Aceh.*

**Keywords:** *media, snakes and ladders, interest in learning*

### 1. Introduction

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, the nation and the state. One of the main factors in achieving success in any field, whether in the form of study, work, hobby or any activity, is interest. The growth of interest in a person will give rise to attention to doing something diligently for a long period of time, concentrate more, remember easily and don't get bored easily with what is being studied. Interest in learning consists of two words, namely interest and learning. According to Erlando (2016), interest has a role in "generating immediate attention, facilitating the creation of focused attention, and preventing distractions from outside attention".

Mathematics is the science of logic regarding shape, arrangement, quantity, and concepts that are related to each other. Mathematics is able to develop itself as a science to serve the needs of developing other sciences. Therefore, mastery of mathematics is important for developing the quality of society in facing challenges in the current era of technological development.

Interest is a persistent tendency to pay attention to and remember several activities "interest is a persistent tendency to pay attention to and enjoy the same activities and or content" (Slameto, 2010). According to Fadillah (2016), interest in learning is a hobby, activity or activities that will support the smooth running of learning activities. According

to Susanto (2016), interest is what he calls subject-related affect, which includes interest and attitudes towards the subject matter. Interest is a persistent tendency to pay attention by remembering several activities (Djamarah, 2011).

The survey results show that students' interest in learning mathematics in Indonesia is ranked low. The results of the 2015 PISA survey by OECD (2016) show that in the field of mathematics, Indonesia is ranked 62<sup>nd</sup> out of 70 countries. Indonesia is still below the international average in the field of mathematics with a score of 386 while the international average score is 490. Based on the survey results, it can be concluded that Indonesian students' abilities in mathematics are still low, especially regarding their interest in learning mathematics. This result is one of the tasks for elementary school teachers as the first basis for formal education in learning mathematics, in order to develop the quality of mathematics education. There is a paradigm developing among society that the learning process tends to be with books, and writing has inadvertently killed the creativity of our teaching staff to produce a dynamic and effective teaching system. One of the reasons is the lack of teacher tips for building interactive relationships in teaching and learning activities, namely the lack of teacher knowledge about the development and benefits of alternative learning media.

In line with the problems above and based on the results of initial observations that the authors got in the field, there are several obstacles and obstacles in the mathematics learning process, especially for Class V students at SD 53 Banda Aceh, one of which is the students' lack of interest in learning mathematics caused by several things, namely the students' lack of focus on The learning provided by the teacher is because the learning provided is less interesting and monotonous because the learning only focuses on textbooks. Another thing that causes students' lack of interest in learning mathematics is that the media used is less varied and the students' lack of involvement in the use of the media provided. Therefore, to overcome this problem, researchers want to increase students' interest in learning mathematics by using interesting media and involving students in using the media so that learning becomes fun. The media used is the snakes and ladders game in mathematics.

At the elementary school education level in Indonesia, especially mathematics, is a subject that is focused on students. In learning mathematics, many problems are encountered, such as students' lack of enthusiasm in the learning process because mathematics subjects tend to be boring. In this regard, in the context of mathematics learning, teacher creativity is needed in a lesson, for example by applying interesting learning media. In the teaching and learning process, the existence of media has quite an important meaning. Because in this activity the ambiguity of the material presented can be helped by using the media as an intermediary. The complexity of the material presented to students can be simplified with the help of media. Media can represent what teachers are unable to say through certain words or sentences. Even the abstractness of the material can be concretized by the presence of the media. In this way, students can more easily digest the material than without the help of the media.

The use of learning media will play an important role in increasing students' interest in learning mathematics. The media used is the Snakes and Ladders Game media. Snakes and Ladders Game Media is a game media consisting of paper boxes containing images of snakes and ladders connected to other boxes. According to Syafitri et al., (2019), Snakes and Ladders Game is a variation of the traditional game of Snakes and Ladders in general. This game has been modified so that math lessons can be loaded from this classic game. According to Kurniasih and Sriwartini (2022), this game method can

make students interested and enthusiastic in participating in mathematics learning, because apart from playing, students also learn in an exciting way. The steps for the game Snakes and Ladders Numeration, namely: (1) review the questions on the pile of cards in the Snakes and Ladders game, (2) explain the game procedures and rules for taking and answering the question cards on Snakes and Ladders, (3) grouping students, (4) starting the game, as stated by Suciati (2021). By referring to the explanation above, the researchers are interested in researching more deeply what happens in the use of the Snakes and Ladders game media to increase students' interest in learning mathematics at SD 53 Banda Aceh. Using this media can make mathematics learning more enjoyable.

## 2. Method

This research uses a quantitative approach. Quantitative research is systematic, planned and structured research that is made clearly from the beginning of the research until the end of the research as stated by Siyoto (2015). According to Hadani (2020), quantitative research aims to connect natural phenomena that occur with mathematical models and theories. An important part of quantitative research is the measurement process. Meanwhile, the design used in this research is Quasi Experimental Pretest-Posttest Control Group Design.

O    X1    O    *Experimental Group*

O    X2    O    *Control Group*

Description:

O : Pretest/Posttest Questionnaire

X1 : Use of Snakes and Ladders Game Media

X2 : Conventional learning

The population in this study were all class V students at SD Negeri 53 Banda Aceh, consisting of classes VA, VB, and VC. The sample selection in this study used random sampling technique. Class VB was chosen as the experimental class, while class VC was the class chosen as the control class. Data was collected in this research by giving questionnaire questions to see students' interest in learning mathematics.

The data from the questionnaire results of students' interest in learning mathematics using snakes and ladders game media in the experimental class and control class, were analyzed by comparing the pretest and posttest questionnaire scores. This test was conducted for the normalized gain score data on learning interest. The statistical test uses the Levene test with the test criteria to accept  $H_0$  if sig. Based Mean > significance level ( $\alpha = 0.05$ ). Two mean difference tests for normalized gain score data in both classes. If both mean gain scores are normally distributed and homogeneous, the statistical test used is the t-test.

## 3. Results and Discussions

### *Analysis of Increased Student Interest in Learning Mathematics*

To find out whether the increase in students' interest in learning mathematics in the experimental and control classes is significantly different, it is necessary to test the average difference analysis of the N-Gain data from the two classes. In accordance with the purpose of the N-Gain calculation, namely to determine the increase in students'

interest in learning mathematics after learning with the application of the PBL model assisted by numerical snakes and ladders media for the experimental class and learning with the application of conventional learning in the control class is carried out, the N-Gain data is tested to find out the better improvement between the two classes that are sampled in this study. Descriptive statistics of N-Gain values of experimental and control classes can be seen in the following table.

**Table 1.** Descriptive statistics of N-gain data of students' mathematics learning interest

|              | N  | Min  | Max  | Mean  | Std. Deviation |
|--------------|----|------|------|-------|----------------|
| Experimental | 29 | 0.10 | 0.92 | 0.622 | 0.22583        |
| Control      | 28 | 0.06 | 0.88 | 0.496 | 0.27933        |

Based on Table 1 above, it can be seen that the average N-Gain of control class and experimental class is 0.622 and 0.496. The data shows that the average increase in students' interest in learning mathematics in the experimental class is better than the control class. However, further statistical tests are needed to determine that the experimental class improvement is better than the control class, namely the t-test.

#### *Normality Test of N-Gain of Students' Mathematics Learning Interest*

The hypotheses to be tested are:

$H_0$  : Students' confidence N-Gain scores are normally distributed

$H_a$  : Students' confidence N-Gain scores are not normally distributed

Testing the normality of students' confidence N-Gain using the Kolmogorov-Smirnov test through SPSS 16.0 at the significance level  $\alpha = 0.05$ . The test criteria are rejected if Sig. < significance level. The complete calculation can be seen in the following normality test.

**Table 2.** N-gain data normality test results students' interest in learning mathematics

|              | Kolmogorov-Smirnov |    |       | Conclusion     |
|--------------|--------------------|----|-------|----------------|
|              | Statistics         | Df | Sig.  |                |
| Experimental | 0.132              | 29 | 0.200 | $H_0$ accepted |
| Control      | 0.113              | 28 | 0.056 | $H_0$ accepted |

Based on Table 2, it can be seen that the significant value of the N-Gain of the two classes is more than 0.05. This means that the experimental class N-Gain data and control class N-Gain data are normally distributed. Because both data are normally distributed, it will continue to test the homogeneity of the two variances.

#### *Homogeneity Test of N-Gain of Interest in Learning Mathematics*

Based on the results of the normality test, it is known that the N-Gain data on the interest in learning mathematics in both classes are normally distributed. The next step is to conduct a homogeneity test on the two data. The variant homogeneity test carried out in this study is the Levene's Test with the formulation of the test hypothesis as follows.

$H_0$  : Both classes have homogeneous variants

$H_a$  : Both classes have variants that are not homogeneous

By using the significance level  $\alpha = 0.05$ , the test criteria are:

Accepted  $H_0$  if the sig value.  $\geq \alpha$

Rejected  $H_0$  if the sig value.  $\leq \alpha$

The results of the analysis of homogeneity of variance Levene Statistic Test for pretest data of experimental and control classes are presented in the following table.

**Table 3.** Homogeneity test of N-gain data of students' mathematics learning interest

|              | Levene Statistic | df1 | df2 | Sig.  |
|--------------|------------------|-----|-----|-------|
| Experimental | 0.283            | 1   | 55  | 0.597 |
| Control      |                  |     |     |       |

Based on Table 3, the N-Gain score of students' interest in learning mathematics in the experimental class and control class has a significant value of 0.597 which is greater than  $\alpha = 0.05$ . This means that  $H_0$  is accepted or in other words, the N-Gain of the two classes has a homogeneous variant. Because both sample groups have homogeneous variants, it will be continued with the t test.

#### *Test of Average Difference in N-Gain of Students' Mathematics Learning Interest*

The test of the difference in the average N-Gain of students' interest in learning mathematics in the two classes aims to prove the first hypothesis. The research hypotheses proposed are:

$H_0$  : There is no increase in students' interest in learning mathematics taught using snakes and ladders game media at SD 53 Banda Aceh.

$H_a$  : There is an increase in students' interest in learning mathematics taught using snakes and ladders game media at SD 53 Banda Aceh.

The calculation uses SPSS 16.0 at the significance level  $\alpha = 0.05$ . The test criterion is to reject  $H_0$  if Sig. (2-tailed)  $<$  the significance level ( $\alpha = 0.05$ ). The full calculation can be seen in Table 4 below.

**Table 4.** The mean difference test of N-gain of students' mathematics learning interest

| T-Count | Sig (2-tailed) | Description    |
|---------|----------------|----------------|
| 1.780   | 0,031          | $H_0$ Rejected |

Based on Table 4, the N-Gain of students' interest in learning mathematics has a Sig value. (2-tailed) = 0.031. Because the value of Sig. (2-tailed)  $<$  the Significance level ( $\alpha = 0.05$ ), it is rejected and  $H_a$  is accepted. Thus, it can be concluded that there is an increase in the N-Gain of students' interest in learning mathematics taught with snakes and ladders game media with the average N-Gain of interest in learning mathematics taught with conventional learning. When viewed from the average N-Gain value of the experimental class and control class, the experimental class N-Gain value is higher than the control class, so it can be concluded that the increase in students' interest in learning mathematics in the experimental class is better than the control class. These findings strengthen Kurniasih and Sriwartini's research (2022) which concluded that the application of the Atik model can improve numeracy literacy skills and student interest in learning through the giant snakes and ladders game media.

#### 4. Conclusions

Based on the results of the study, it can be concluded that there is an increase in students' interest in learning mathematics by using the Snakes and Ladders Game media on number material. This is based on data obtained from questionnaires of students' interest in learning mathematics given at pre-action, and the end of the second RRP meeting. Based on the analysis of the results of the questionnaire of students' interest in learning mathematics pretest and posttest, the normalized gain (N-Gain) of students' interest in learning mathematics has a Sig. (2-tailed) = 0.031. Because the value of Sig. (2-tailed) < the Significance level ( $\alpha = 0.05$ ), so  $H_0$  is rejected and  $H_a$  is accepted. Thus, it can be concluded that there is a difference between the average N-Gain of students' interest in learning mathematics taught with snakes and ladders game media and the average N-Gain of students' interest in learning mathematics taught with conventional learning. When viewed from the average N-Gain value of the experimental class and the control class, the experimental class N-Gain value is higher than the control class, so it can be concluded that there is an increase in students' interest in learning mathematics taught through the use of snakes and ladders game media at SD 53 Banda Aceh.

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#### 6. References

- Djamarah, S. B. (2011). *Psikologi Belajar*. Jakarta: Rineka Cipta
- Erlando D. S. (2016). Pengaruh Minat Belajar Terhadap Prestasi Belajar Matematika. *Jurnal Formatif*, 6(1), 35-46. <https://journal.lppmunindra.ac.id/index.php/Formatif/index>.
- Fadillah. A. (2016). Analisis Minat Belajar dan Bakat Terhadap Hasil Belajar Matematika Siswa. *Jurnal Matematika dan Pendidikan Matematika*. 1(2), August 2016, 113-122. <https://mathline.unwir.ac.id/index.php/Mathline/article/view/23>
- Hadani, DKK. (2020). *Metode Penelitian Kualitatif & Kuantitatif*, ed. Husnu Abadi, 1 ed. Yogyakarta: CV. Pustaka Ilmu Group Yogyakarta. 44 Ibid, 356.
- Kurniasih & Sriwartini. (2022). Penerapan Model ATIK untuk Meningkatkan Literasi Numerasi Anak Usia Dini Melalui Media Permainan Ular Tangga Raksasa di Pos Paud Pelangi. *Edukasia: Jurnal Pendidikan dan Pembelajaran*, 3(1), 145-156. <https://www.jurnaledukasia.org/index.php/edukasia/article/view/79>
- OECD. (2016). PISA 2015: Result in Focus (Online). <https://www.oecd.org/pisa/pisa-2015-resultinfocus.pdf>
- Slameto. (2010). *Belajar dan Faktor-Faktor yang Mempengaruhinya*. Rineka Cipta
- Suciati, I. (2021). Metode permainan Ular Tangga Matematika Pada materi Bilangan Pecahan. *Guru Tua: Jurnal Pendidikan dan Pembelajaran*, 4(1), 36-41.

- Susanto, A. (2016). *Teori Belajar dan Pembelajaran di SD*. Jakarta: Prenadamedia Group.
- Siyoto, S. (2015). *Dasar Metodologi Penelitian*, ed. Ayub, 1 ed. Sleman: Literasi Media Publishing.
- Syafitri. (2019). Perbandingan hasil belajar siswa menggunakan pembelajaran kooperatif tipe TGT dengan media Ular Tangga dan media Puzzle di kelas XI SMA Negeri 01 Bengkulu Tengah. *Jurnal pendidikan dan Ilmu Kimia*. 3(2), 132-138. <https://ejournal.unib.ac.id/alotropjurnal/article/view/9911>