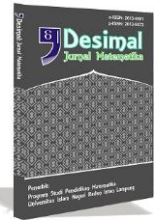




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# The effect of the course review horay learning model on students' mathematical reasoning abilities

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## ABSTRACT

Mathematics is a science that is acquired through reason because one of the goals of mathematics education is for students to develop the ability to reason. The purpose of this research is to determine the effect of the Course Review Horay learning model on students' mathematical reasoning abilities. This research is a type of quantitative research. The sampling strategy of cluster random sampling was used to select the sample in this research. The instrument used to collect data is a test of mathematical reasoning abilities in the form of description questions. Normality test, homogeneity, and hypothesis testing with t-test are part of the data analysis approach of this research. Based on the results of the t-test analysis, the results obtained sig. (2-tailed), where the result is 0.000 which is smaller than 0.05. So, it can be concluded that there is an effect of the Course Review Horay learning model on students' mathematical reasoning abilities.

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## INTRODUCTION

Humans really need education because of the quality and characteristics of humans to be able to have aspirations and broad insights obtained through education (Fiani et al., 2021). High-quality education has a significant impact on the welfare of a country. A student's full potential can be realized by high-quality education. As stipulated in Law Number 19 of 2005 concerning National Education Standards, mathematics is included as a discipline or topic in the second semester of primary school, junior high school, and

high school education (Rahmadian et al., 2019).

In particular, mathematics acts as a standard reference at the time of graduation informal education in the school environment. Thus, learning mathematics is very important for students (Hanifah et al., 2019). Mathematics as a reasoning-based science is in accordance with one of its goals, which is to prepare students to apply reasoning and solving to properties and patterns, as well as demonstrate mathematical intelligence in generalizing,

compiling evidence, and explaining mathematical concepts and concepts (Sihombing et al., 2021). In learning mathematics, several abilities should be grown, namely the ability to reason (Fedistia & Musdi, 2020).

If reasoning abilities are not developed, the material becomes material that follows the sequence of operations and duplicates examples without understanding their significance, because reasoning abilities are the foundation of mathematics (Mahendra et al., 2019). Reasoning ability is an indispensable part of learning mathematics (Sukirwan et al., 2018). The ability to relate a problem to the mind in such a way that it can be solved mathematically is the definition of mathematical reasoning (Salmina & Nisa, 2018). So, reasoning abilities with mathematics are interrelated in solving problems that can be honed by learning mathematics. Another opinion states that reasoning ability is a thinking activity to realize new explanations which are based on previous explanations and their validity has been confirmed (Sumartini, 2015). This is in line with Nuralam & Maulidayani (2020) opinion about mathematical reasoning abilities, namely a rational way of thinking about mathematical material that is carried out rationally to realize a generalization and draw a conclusion. According to the definition above, the thinking process that produces conclusions or makes new hypotheses logically based on valid data is a student's mathematical reasoning.

Indicators can be used to track student growth in mathematical reasoning abilities. The indicators include the ability to make predictions, perform mathematical fraud, draw conclusions, collect evidence, conclude conclusions from statements, provide information about the truth of a solution, discover the nature of mathematical phenomena to be able to make generalizations, and evaluate the validity of an argument. In addition,

four measures of mathematical reasoning ability used are 1) drawing conclusions from statements, 2) performing mathematical operations, 3) presenting logical arguments, and 4) make a conjecture. (Firdausy et al., 2021).

Students' ability in learning arithmetic is influenced by mathematical reasoning abilities, students will understand more easily if they have strong reasoning abilities while students with weak reasoning abilities will have difficulty capturing information (Tukaryanto et al., 2018). Reasoning ability is very important for students because it allows them to make generalizations, compile proofs, and explain mathematical concepts and claims Law Number 22 of 2006 concerning Standards for Mathematical Content, Reasoning ability is very important for students because with that they are able to construct proofs, make generalizations and explain mathematical concepts and claims as stated in Melani & Sutirna (2019). As a result, students' mathematical thinking skills are very important for their success in mathematics class (Faradillah, 2018).

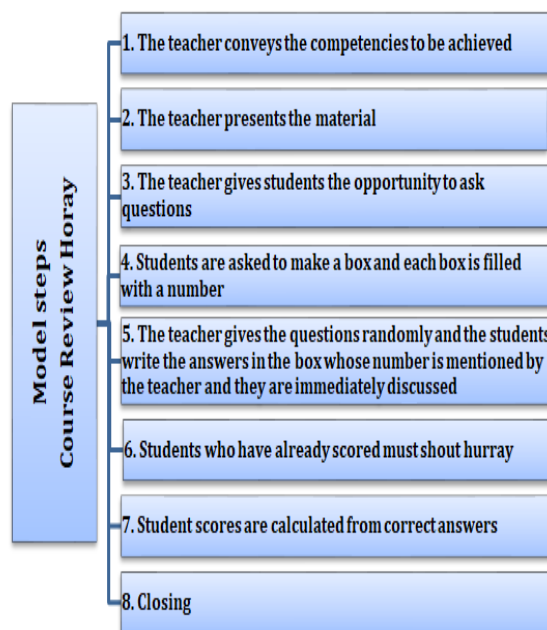
However, the reality is that students' mathematical reasoning abilities in the field are still low among students. Based on the test results given to children, four students (13.33 percent) Drawing conclusions from the statement, twenty students (66.7 percent) Performing mathematical operations, six students (20 percent) Presenting logical arguments, and three students (10 percent) put forward an allegation. Due to the limited ability of students to think mathematically, their learning capacity will be affected, which will contradict their poor academic performance. As mentioned by Yunus et al. (2019), that the elements that contribute to low mathematical reasoning abilities may come from the students themselves, the teacher, or the learning environment.

One of the reasons for the poor mathematical reasoning ability of students is that the instructors in the classroom do not actively involve their students in the learning process (Buraish et al., 2016). Because learning is dominated by expansive methods, which require learning activities that are fully focused on the teacher, this also causes a lack of students' mathematical thinking skills when learning mathematics (Mariyam & Wahyuni, 2016).

The development of students' reasoning abilities is highly dependent on the use of learning models that make them interested in the learning process (Konita et al., 2019). As a result, instructors have to use a variety of math learning models to keep students engaged in class and not bored, as they have been doing for almost a semester. Course Review Horay (CRH) attracts researchers to conduct research as a method to improve students' mathematical thinking skills.

Classes can be made livelier and more interesting by using the Course Review Horay (CRH) teaching approach (Khairani & Febrinal, 2020). Using the CRH approach, the teacher works as a facilitator, ensuring that students are actively involved in the learning process (Kariadnyani et al., 2016).

According to Mediatati & Suryaningsih (2017), the following phases are the Course Review Horay learning model:



**Figure 1.** Model Steps Course Review Horay

Many studies have discussed the Course Review Horay (CRH) learning model. As revealed by Suryani et al. (2016) that significantly increasing mathematical understanding and ambition to learn mathematics can be through the Course Review Horay approach. The difference between this research and Suryani's research lies in its capacity to be quantified. Suryani's research measures students' enthusiasm for learning mathematics and students' mathematical understanding, while this study measures students' mathematical reasoning.

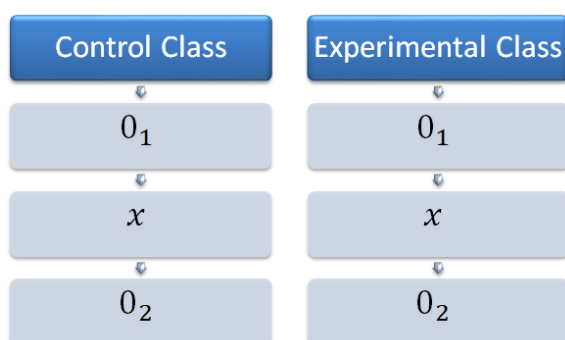
Based on the research results of Linuhung & Sudarman (2016), applying the GI learning paradigm rather than standard learning can improve students' mathematical reasoning abilities. According to the conclusion of this study, both of them pay attention to students' mathematical thinking abilities. As far as we know, no previous research has looked at how the Horay Course Review learning model affects students' mathematical reasoning skills or reasoning abilities. The researcher plans research entitled "The Effect of the Course Review Horay Learning Model on Students'

Mathematical Reasoning Abilities". This will measure how well students' mathematical reasoning skills correlate with the course review learning model.

## METHOD

It is a kind of quantitative research in which a quasi-experimental paradigm is used. The researchers use this technique because researchers do not have complete control over the factors that affect the results of the experiment. The researchers used a control class and an experimental class but did not allocate students randomly to one of the groups. This research took place at SMP PAB 3 SAINTIS. This research program will take place during the odd semester of the 2021/2022 academic year.

For the purposes of this research, the treatment design for the research sample is:



**Figure 2.** Treatment Design

Remarks :

X : Learning with Horay Course Review model.

$O_1$  : Giving an initial test (pretest) mathematical reasoning ability.

$O_2$  : Giving a final test (post-test) mathematical reasoning ability.

The population in this research was every student at SMP PAB 3 SAINTIS Percut Sei Tuan, Deli Serdang Regency. The research sample consisted of students in grade seven. Class VII-1 was chosen as the control class, and class VII-5 was chosen as the experimental class, using the

cluster random sampling technique. The variables used are dependent and independent variables. Where the Course Review Horay in the experimental class and the direct learning model used by the control class are independent variables. While the dependent variable inline research is the student's mathematical reasoning ability.

The three steps of the research process are preparation, implementation, and conclusion. Preparation begins with making research proposals, followed by making research instruments, and making student worksheets and lesson plans (RPP). This is when the study is put into practice, at the implementation stage. Meanwhile, the students were taking their final exams in the final stage. This study uses a single question sheet as the instrument. The Horay Course Review learning paradigm was tested using a test instrument to see if it had an effect on students' mathematical reasoning abilities in solving problems.

The indicators of students' mathematical reasoning abilities used in this study are: 1) Submitting conjectures, 2) Performing mathematical manipulations, 3) Preparing evidence and arguments for solution accuracy (for example, evidence), 4) Checking the truth of arguments 5) Drawing conclusions from statements. The learning materials in this research are: "Set".

Exam questions are carefully checked before being given to the class directly. To get a solid instrument, it is necessary to run many different test questions through iterative cycles. After the data has been collected, it is time to conduct an in-depth study of it. It includes computational test variables including discriminatory index, difficulty index, and validity index. Then it was decided to do a final exam on each of the two sample classes after evaluating all the results of the test questions. The final test data were analyzed using a homogeneity test and

normality test to confirm that all participant data were normally distributed and consistent. The T-test is used as a statistical tool in this research.

## RESULTS AND DISCUSSION

Based on research conducted at SMP PAB 3 SAINTIS. The discoveries of this

research are the scores of students' mathematical reasoning skills which are determined by the results of the pretest and posttest. The pretest and posttest descriptive statistical calculations yielded can be seen in Table 1.

**Table 1.** Pretest-Posttest Descriptive Statistical Data Analysis Results

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Experiment Pretest	30	25	50	37.17	7.391
Experiment Posttest	30	45	95	69.67	11.740
Pretest Control	31	25	50	35.48	6.874
Posttest Control	31	30	65	46.45	7.978
Valid N (listwise)	30				

Based on Table 1, 37.17 and 69.67 are the results of the pretest and posttest experimental class, respectively. Meanwhile, in the control class, the results of the pretest and posttest were 35.48 and 46.45, respectively. This illustrates that students' mathematical thinking skills increase when they learn to use the Course Review Horay methodology. Furthermore, the results of data processing by calculating the validity of the instrument

trial obtained the results of 5 valid questions from the 5 items proposed. The results of the calculation of the reliability of mathematical reasoning abilities with the Cronbach Alpha formula obtained  $r_{11} = 0.814$ . The discoveries of this research require an initial evaluation of the normality and homogeneity tests. Lilliefors test is used to determine normality, while Fisher's test is used to determine homogeneity.

**Table 2.** Research Data Normality Test Results

	Class	Shapiro-Wilk		
		Statistics	Degree of Freedom	Significant
Mathematical Reasoning Ability	Experiment Pretest	.934	30	.061
	Experiment Posttest	.955	30	.232
	Pretest Control	.934	31	.057
	Posttest Control	.960	31	.294

Based on Table 2, the results of the Shapiro-Wilk normality test can be seen that the research data is normally distributed which is known from the sig value. Experimental pretest of 0.061 the value of sig. Posttest Experiment of 0.232, the value of sig. Pretest control 0.057, and

the value of sig. Posttest Control of 0.294. Based on this data, it can be seen that the results of the normality test are test are normally distributed. After the data is normally distributed, the homogeneity test is then carried out using Fisher's test.

**Table 3.** Result of Homogeneity Test of Research Data

	Levene Statistic	Degree of Freedom1	Degree of Freedom2	Significant
Mathematical Reasoning Ability	2.076	1	59	.155

Based on Table 3, the homogeneity test above can be concluded that the data is homogeneous because the significance value obtained is  $\geq 0.05$ . After the data is

normally distributed and homogeneous, then the data will be tested for hypotheses using the independent sample t-test.

**Table 4.** Hypothesis Test Results

		Levene's Test for Equality of Variances				
		Frequency	Significant	T	Degree of Freedom	Significant (2-tailed)
Mathematical Reasoning Ability	Equal variances assumed	2.076	.155	-9.060	59	.000
	Equal variances not assumed			-9.004	50.891	.000

Based on Table 4, the results of sig. (2-tailed), where the result is 0.000 which is  $< 0.05$ . Thus, there is a statistically significant difference between the results of the pretest-posttest mathematical reasoning abilities of students in grades VII-5 who are taught by the Course Review Horay model and students of grades VII-1 who are taught by conventional models.

Based on several previous researches, direct learning strategies are no more effective than adopting a course review horay-type cooperative learning model that can help students achieve better learning outcomes. In addition, the results of the study (Hasibuan, 2019) show that the Course Review Horay (CRH) learning model has a stronger effect on student mathematics learning outcomes than the conventional model on one-variable linear equation material in class VII at Rantau Selatan State Junior High School.

Students' mathematical reasoning abilities differ between students in the experimental class and students in the control class because the Course Review Horay model provides opportunities for

students to interact with each other, be responsible, train students to cooperate in the learning process, train students' memory, and concentration, and exchange ideas. to find out that students experience changes in both the phases of the Course Review Horay learning model and their mathematical reasoning abilities. Muhandaz et al. (2018) conducted research that strengthened this research by showing differences in students' ability to understand mathematical concepts and proved that learning with the Course Review Horay model in the experimental class was better than learning in the control class with the conventional model.

This is of course in sync with what was explained earlier, the Course Review Horay learning model is one of the learning models that improve students' mathematical reasoning abilities because the Course Review Horay model can also improve the ability to understand good concepts so that it can support students' mathematical reasoning, centered learning. in reasoning requires a lower stage design, because students' mathematical reasoning abilities do not

exist without good understanding abilities.

Thus, the discoveries of this research can be concluded that the Course Review Horay model on students' mathematical reasoning abilities has an influence so that the experimental class's reasoning ability is greater than the control class's reasoning ability.

## CONCLUSIONS AND SUGGESTIONS

The conclusion of this research is that the Course Review Horay (CRH) learning model has a greater impact on students' mathematical reasoning abilities than traditional learning methods. The learning model has a big influence.

Based on the conclusions above, the researchers provide suggestions; (1) Teachers should use various learning models, such as the CRH model, to create a pleasant learning environment that encourages students to participate in continuous mathematics learning; (2) Teachers must be able to adapt the learning model to the needs of their students. (3) Teachers should also actively involve or involve their students in the learning process; (4) Students should be more involved in their learning without being intimidated by the prospect of answering a problem or series of arithmetic questions. (5) It is recommended that this research be further improved by increasing presentation materials for researchers who wish to conduct similar research in the future using different strategies, and have the ability to maximize time to improve students' mathematics learning outcomes.

## REFERENCES

- Burais, L., Ikhsan, M., & Duskri, M. (2016). Peningkatan kemampuan penalaran matematis siswa melalui model discovery learning. *Jurnal Didaktik Matematika*, 3(1), 77-86.
- Faradillah, A. (2018). Analysis of

mathematical reasoning ability of pre-service mathematics teachers in solving algebra problem based on reflective cognitive style. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, 8(2), 119-128.

<https://doi.org/10.30998/formatif.v8i2.2333>

- Fedistia, R., & Musdi, E. (2020). Efektivitas perangkat pembelajaran berbasis flipped classroom untuk meningkatkan kemampuan penalaran matematis peserta didik. *Jurnal Didaktik Matematika*, 7(1), 45-59.

<https://doi.org/10.24815/jdm.v7i1.14371>

- Fiani, R., Sudargo, S., & Kusumaningsih, W. (2021). Efektivitas model pembelajaran ati dan crh menggunakan strategi guided teaching terhadap kemampuan pemahaman konsep. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 3(5), 388-396.

- Firdausy, A. R., Triyanto, & Indriati, D. (2021). Mathematical reasoning abilities of high school students in solving contextual problems. *International Journal of Science and Society*, 3(1), 201-211. <https://doi.org/10.54783/ijsoc.v3i1.285>

- Hanifah, A. N., Sa'adah, N., & Sasongko, A. D. (2019). Hubungan kemampuan penalaran matematis dan motivasi belajar siswa smk melalui model pembelajaran hypnoteaching. *Teorema: Teori Dan Riset Matematika*, 4(2), 121-130. <https://doi.org/10.25157/teorema.v4i2.2692>

- Hasibuan, L. R. (2019). Pengaruh model pembelajaran kooperatif tipe course review horay (crh) terhadap hasil belajar matematika siswa pada materi persamaan linear satu variabel di kelas vii smp negeri rantau selatan. *JURNAL PEMBELAJARAN DAN*



- MATEMATIKA SIGMA (JPMS)*, 5(1).  
<https://doi.org/10.36987/jpms.v5i1.1238>
- Kariadnyani, K. E., Kd Suartama, I., Sumantri, M., Pendidikan Guru, J., Dasar, S., & Pendidikan, J. T. (2016). Pengaruh model course review horay berbantuan multimedia terhadap hasil belajar ipa siswa kelas v sd. In *Journal PGSD Universitas Pendidikan Ganesha Jurusan PGSD* (Vol. 4, Issue 1).
- Khairani, M., & Febrinal, D. (2020). Pembelajaran kooperatif tipe course review horay (crh) terhadap pemahaman konsep matematika siswa. *Jurnal Ilmu Pendidikan*, 1(2), 54–60.
- Konita, M., Asikin, M., & Asih, T. S. N. (2019). Kemampuan penalaran matematis melalui model pembelajaran connecting, organizing, reflecting, extending (core). *PRISMA, Prosiding Seminar Nasional Matematika*, 611–615.
- Linuhung, N., & Sudarman, S. W. (2016). Pengaruh pembelajaran kooperatif tipe group investigation (gi) terhadap kemampuan penalaran matematis siswa mts. *AKSIOMA Journal of Mathematics Education*, 5(1).  
<https://doi.org/10.24127/ajpm.v5i1.465>
- Mahendra, A. E., Caswita, C., & Bharata, H. (2019). Pengembangan lembar kerja peserta didik berbasis problem based learning untuk meningkatkan kemampuan penalaran matematika. *Desimal: Jurnal Matematika*, 2(2), 141–146.  
<https://doi.org/10.24042/djm.v2i2.4238>
- Mariyam, M., & Wahyuni, R. (2016). Mengembangkan kemampuan penalaran matematis siswa melalui problem centered learning pada materi peluang (studi eksperimen di kelas viii smp n 6 singkawang). *JPMI (Jurnal Pendidikan Matematika Indonesia)*, 1(2), 74–80.  
<https://doi.org/10.26737/jpmi.v1i2.86>
- Mediatati, N., & Suryaningsih, I. (2017). Penggunaan model pembelajaran course review horay dengan media flipchart sebagai upaya meningkatkan hasil belajar pkn. *Jurnal Ilmiah Sekolah Dasar*, 1(2), 113–121.  
<https://doi.org/10.23887/jisd.v1i2.10146>
- Melani, F., & Sutirna. (2019). Analisis kemampuan penalaran matematis siswa smp kelas viii pada materi relasi dan fungsi. *Seminar Nasional Matematika Dan Pendidikan Matematika*, 188–193.
- Muhandaz, R., Trisnawita, O., & Risnawati, R. (2018). Pengaruh model pembelajaran course review horay terhadap kemampuan pemahaman konsep matematis berdasarkan kemandirian belajar siswa smk pekanbaru. *JURING (Journal for Research in Mathematics Learning)*, 1(2).  
<https://doi.org/10.24014/juring.v1i2.6552>
- Nuralam, N., & Maulidayani, M. (2020). Capaian kemampuan penalaran matematis siswa dengan model air. *Numeracy*, 7(1), 35–48.  
<https://doi.org/10.46244/numeracy.v7i1.997>
- Rahmadian, N., Mulyono, & Isnarto. (2019). Kemampuan representasi matematis siswa dalam model pembelajaran somatic, auditory, visualization, intellectually (SAVI). *PRISMA, Prosiding Seminar Nasional Matematika*, 2, 287–292.
- Salmina, M., & Nisa, S. K. (2018). Kemampuan penalaran matematis siswa berdasarkan gender pada materi geometri. *Jurnal Numeracy*, 5(1), 41–48.
- Sihombing, C. E., Lubis, R., & Ardiana, N. (2021). Analisis kemampuan



- penalaran matematis siswa selama pandemi covid-19 ditinjau dari minat belajar siswa. *JURNAL MathEdu (Mathematic Education Journal)*, 4(2), 285–290.  
<https://doi.org/10.37081/mathedu.v4i2.2540>
- Sukirwan, Darhim, D., & Herman, T. (2018). Analysis of students' mathematical reasoning. *Journal of Physics: Conference Series*, 948(1), 1–7. <https://doi.org/10.1088/1742-6596/948/1/012036>
- Sumartini, T. S. (2015). Peningkatan kemampuan penalaran matematis siswa melalui pembelajaran berbasis masalah. *Mosharafa Jurnal Pendidikan Matematika*, 5(1), 1–10.
- Suryani, A., Maulana, M., & Julia, J. (2016). Pengaruh pendekatan course review horay (crh) terhadap pemahaman matematis dan motivasi belajar matematika siswa sekolah dasar pada materi penjumlahan dan pengurangan bilangan bulat. *Jurnal Pena Ilmiah*, 1(1).
- Tukaryanto, T., Hendikawati, P., & Nugroho, S. (2018). Peningkatan kemampuan penalaran matematik dan percaya diri siswa kelas x melalui model discovery learning. *PRISMA, Prosiding Seminar Nasional Matematika*, 1, 656–662.
- Yunus, N. A., Hulukati, E., & Djakaria, I. (2019). Pengaruh pendekatan kontekstual terhadap kemampuan penalaran matematis ditinjau dari gaya kognitif peserta didik. *Jambura Journal of Mathematics*, 2(1), 30–38. <https://doi.org/10.34312/jjom.v2i1.2591>

