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IMPLEMENTATION OF HYPOTHETICAL LEARNING TRAJECTORY BASED ON REALISTIC MATHEMATIC EDUCATION ON STUDENTS' CONCEPTUAL UNDERSTANDING

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ABSTRACT
Good learning design is a learning design that is adjusted to the needs of students in order to achieve the learning objectives that have been set. This study aims to analyze students' understanding of mathematical concepts in Realistic Mathematic Education learning with students who do not apply hypothetical learning trajectory to trigonometric comparison material. Quantitative research method with phonomology design. The subjects of this study were 28 students of class X IPA at SMA 1 Boyolali. The data and data sources in this study consisted of the results of observations of test answers, and interview results. Data collection techniques from written test results (diagnostic tests), interviews and observations. The results of the study obtained the results of the Mann-Whitney test on the post-test value data showed a significance value of 0.000 on students' conceptual understanding. This significance value is smaller than the significance level of $\alpha = 0.05$ so that there is a significant difference in the average value of conceptual understanding between the experimental and control classes. So it can be concluded that students in the experimental class who were given mathematics learning treatment using RME-based HLT had a better conceptual understanding than students in the control class who were not given treatment.

Keywords: conceptual understanding, hypothetical learning trajectory, realistic mathematic education

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INTRODUCTION

Good learning design is a learning design that is adjusted to the needs of students to achieve the learning objectives set (Isnawan & Wicaksono, 2018). According to Suwarto & Purnami, (2018), to design the learning process begins by finding students' learning difficulties (learning obstacles) first. Teachers need to make predictions about how students are likely to learn mathematics specifically, predicting how students' thinking and understanding abilities will develop in learning activities designed by the teacher (Wandanu & Wandanu, Abdul Mujib, 2020). Teachers must continue to innovate by creating interactive and contextual teaching methods, to increase student involvement in the learning process (Fatkhurohmah et al., 2024). One of them is by applying hypothetical learning trajectories in realistic learning.

Hypothetical learning trajectory or HLT, first proposed by Simon in 1995, states that Hypothetical Learning Trajectory consists of three components: learning goals, learning activities, and hypothetical learning process (Simon., 1995: 73). Hypothetical Learning Trajectory makes it clear that activities and learning processes are interdependent (Simon et al., 2004). Activities are a crucial aspect of the mathematics learning process. Students' involvement in various learning activities plays a major role in determining their success. Without activities, the learning process cannot run effectively (Erlina & Sutarni, 2024). In addition, HLT also involves teachers' thinking about how students will think and understand the context of learning (Gee, 2019).

The four principles used in Hypothetical Learning Trajectory are 1) HLT generation is based on student's current understanding of knowledge; 2) HLT is a container for planning learning of certain mathematical concepts; 3) mathematical tasks provide tools to promote learning of certain mathematical concepts which are the most important part of the learning process; 4) Because of the uncertain and inherent hypothetical nature of this process, teachers are regularly involved in modifying every aspect of HLT (Simon et al., 2004). The description of the learning process in question is when students experience the learning process from the beginning until the learning objectives are achieved (Fuadiah, 2017). From the explanations above, it can be concluded that the Hypothetical Learning Trajectory (HLT) can be interpreted as a design of a travel route in the learning process.

The advantage of the Hypothetical Learning Trajectory in the learning process is that it can provide directed and systematic guidance in understanding how students achieve mathematical understanding from a basic to a deeper level of experience (Rezky & Wijaya, 2018). By using this framework, educators can design learning strategies that suit students' level of understanding at each stage of the learning journey (Suwarto & Purnami, 2018). In addition, HLT helps students build a deeper understanding of mathematical concepts through a series of tasks specifically designed by the teacher (Novita & Putra, 2017). One of the mathematical learning that can improve students' understanding of concepts in the learning process is through realistic-based mathematical learning.

Realistic Mathematics Education (RME) is one of the approaches to learning mathematics. Learning that uses a realistic mathematics approach does not begin with teaching formal mathematics, but rather with experiencing and understanding the importance of mathematics as a human activity (Kurniawaty et al., 2023; Nuraida & Amam, 2019). The learning process is carried out in stages through the initial mathematical knowledge that students already have, presenting problems and results obtained through vertical and horizontal mathematical processes called progressive mathematics. When applied in practice, the RME approach technique provides clear, practical, comprehensive, and detailed knowledge. However, due to several weaknesses in this method, finding examples for each problem can be a challenge (Sutarni & Aryuana, 2023).

Simon et al. (2004) emphasized that the Hypothetical Learning Trajectory strengthens the main principles of Realistic Mathematical Education. Where students learn mathematics through problem exploration, by integrating HLT, teachers can ensure that each student's activity has a clear direction toward the desired learning goals. In addition, this approach can create learning that provides opportunities for students to discover mathematical concepts through solving contextual problems (Gee, 2019).

Marmoah & Istiyati, (2018) stated that a student-oriented learning approach (student center) and a learning design designed according to the flow of student needs (learning trajectory) can guide students' understanding of the material presented (Rezky & Wijaya, 2018). Mathematics learning is a process designed to create an atmosphere that supports students in understanding the relationship between mathematical concepts and structures (Yudhani, n.d.). Ideal mathematics learning cannot be separated from teacher preparation in planning and designing learning that involves students finding knowledge from their thinking process and learning experiences, so that students can connect one concept (material) to another (Hendrik et al., 2020).

Conceptual understanding is the ability to understand comprehensive and functional mathematical ideas (Fahrudin et al., 2018). In addition, conceptual understanding is a student's ability in the form of mastering several learning materials, where students do not just know or remember several concepts learned (Batubara, 2017). There are four indicators of mathematical conceptual understanding measured according to Yesi Gusmania, (2020), namely: (1) restating a concept; (2) concepts are presented in various forms of mathematical representation; (3) using and utilizing and choosing certain procedures or operations; (4) applying concepts or algorithms in problem-solving. Various studies emphasize the importance of mathematical understanding in the learning process (Schaathun, 2022).

Previous research by Schaathun, (2022) emphasized the importance of mathematical understanding in the process of learning mathematics, especially in improving students' critical thinking and problem-solving skills. The importance of understanding concepts is not in line with the quality of the actual ability to understand concepts. Indonesian students' understanding of concepts is still relatively low (Aida et al., 2017). This is shown by the results of the Program Internationale for Student Assessment (PISA), which is a form of evaluation of abilities and knowledge in the fields of mathematics, science, and language in 2022, Indonesia's ranking for mathematics is 74 out of 79 countries (Kemendikbud et al., 2021). Schaathun stated that mathematical understanding is not just memorizing formulas, but includes students' ability to understand concepts, and relationships between concepts, and apply them in real situations. In addition, research conducted by Marmoah & Istiyati, (2018) discussed the importance of developing Learning Trajectories in mathematics learning to help students understand concepts gradually and systematically.

This study aims to design a learning trajectory that suits students' abilities and needs so that learning is more effective. The results of the study showed that the application of a well-designed Learning Trajectory was able to improve students' conceptual understanding and facilitate their thinking process from concrete to abstract understanding. Furthermore, research conducted by Gee, (2019) regarding the application of Hypothetical Learning Trajectory (HLT) can support the development of students' conceptual understanding. This study aims to design and test learning trajectories that include learning objectives, contextually designed learning activities, and predictions of students' thinking processes. The results of the study show that the effective use of HLT can help students build a gradual and in-depth understanding of concepts.

This think about points to analyze students' understanding of numerical concepts in Practical Mathematic Instruction learning with understudies who don't apply speculative learning directions to trigonometric comparison fabric.

METHODS

This research is a quantitative research with a phenomenological approach. The type of research design is a quasi-experiment with posttest-only non-equivalent groups (Darmawan et al., 2023; Qondias et al., 2022). Figure 1 shows the quasi-experimental research design used.

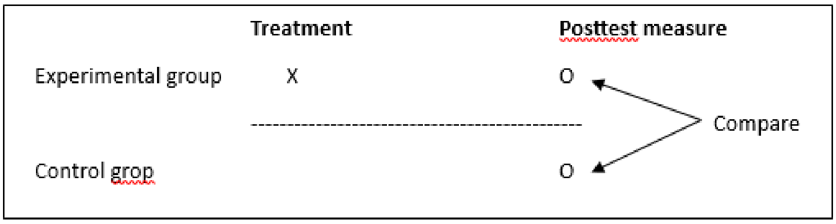

Figure 1. Research Design

The subjects of this ponder were understudies of course X MIPA 4 and X MIPA 5 at SMA Negeri 1 Boyolali, with 36 understudies each. Course X MIPA 4 was an exploratory lesson and given RME learning treatment utilizing HLT, whereas all understudies of course X MIPA 5 as a control course with coordinate learning. The learning instrument was within the shape of a HLT Plan based on RME; and LKPD based on RME. The investigate disobedient utilized were numerical concept understanding capacity test rebellious; perception rebellious; and documentation . Before being used, the trigonometric comparison test questions were validated by two experts in the field of mathematics.

The information collection procedures utilized are test procedures within the frame of a last test for the capacity to get it mathematical concepts; non-test methods within the frame of perceptions to determine the method amid the treatment; and, documentation within the shape of supporting records for prove of inquire about usage.

Data analysis using inferential statistics and descriptive statistics. In inferential statistics, statistical prerequisite tests are carried out first, including normality and homogeneity tests (Budiyono, 2016). After the prerequisite tests are met, the analysis is continued with an independent sample t-test. If one of the prerequisite tests is not met, the analysis is continued with the Mann-Whitney test (Nikitina & Chernukha, 2022). This test is to determine whether there is a difference in student's conceptual understanding in the experimental and control classes. If there is a difference, descriptive statistics will be used to determine which class has better conceptual understanding abilities. The entire data analysis uses SPSS 25 software for its calculations.

RESULTS AND DISCUSSIONS

The comes about of the post-test information procurement of the capacity to get it numerical concepts of understudies within the exploratory lesson Practical Arithmetic Instruction and the control lesson. Post-test information investigation was conducted to determine the contrasts within the procurement of the ability to get it numerical concepts between understudies within the two classes after getting treatment. The theories tried within the typicality test are :

H_0: Posttest scores of students' scientific concept understanding capacity are ordinarily disseminated.
H_a: Posttest scores of students' scientific concept understanding capacity are not ordinarily conveyed.

The testing criteria utilizing the Shapiro-Wilk test are in case the sig. esteem> sig. level (α = 0.05) at that point H_0 is acknowledged, in the event that the sig. esteem < sig. level (α = 0.05) at that point H_0 is rejected. The taking after are the comes about of the typicality test of the challenge scores of students' understanding of numerical concepts between the test course and the control course, which can be seen in Table 1.

Table 1. Normality Test Result

	Shapiro-Wilk		
	Statistic	Df	Sig.
Control	.835	36	.000
Eksperimen	.886	36	.001

Based on Table 1, it can be seen that the normality test with the Shapiro-Wilk test at the centrality level (α = 0.05), the exploratory course RME gotten a noteworthiness regard of the calculation comes approximately of 0.001 and the control course gotten a significance regard of 0.000. It can be concluded that the data isn't regularly scattered. Regularly in line with Arifin et al., (2024) which states that the Sig. esteem = 0.000 <significance level (α = 0.05) then H_0 is rejected and Ha is accepted.

The following step is to test the inquire about theory employing a nonparametric test, to be specific the Mann-Whitney U test. The inquire about hypothesis of work 1, "there's a distinction within the ability to get it numerical concepts between understudies who learn and don't learn in RM) utilizing HLT". Formally H_0 and Ha, as takes after.

H_0 : there is no difference in conceptual understanding ability in both classes

H_a : there are differences in conceptual understanding abilities in both classes

The criteria for theory testing are in the event that the sig. esteem > importance level (α = 0.05) at that point H_0 is acknowledged. In case the sig. esteem < noteworthiness level (α = 0.05) at that point H_0 is rejected. The comes about of the Mann-Whitney U test since the prerequisite test was not met, the examination was proceeded with the Mann-Whitney test.

Table 2. Mann-Whitney U Test Result

Test Statistics[a]	
	Total
Mann-Whitney U	86.000
Wilcoxon W	752.000
Z	-6.333
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: kelas	

Based on table 2, the sig. regard of 0.000 is more diminutive than the centrality level (α = 0.05) so H_0 is rejected and Ha is recognized. So it can be said that the capacity to induce it numerical concepts inside the exploratory lesson is higher than the control course. It can be concluded that there's a refinement inside the capacity to get it numerical concepts between understudies who ponder and understudies who do not consider RME utilizing the HLT. As a rule in line with Arizona et al., (2019) which states that in the event that the comes about of the Mann-Whitney U test with a importance of 5% at that point 0.008 <0.05 the null hypothesis is rejected, and the alternative hypothesis is accepted. This is in line with Pujiastuti & Haryadi (2023) which shows that the N-gain results show that the experimental class obtained a result of 58.88% while the control class was 45.77%. Based on the results of the study by Indrapangastuti et al., (2021) showing the results of the experimental and control classes, the application of the RME model has proven to be effective in improving students' achievement of mathematical concepts. The RME model is an alternative learning model that can be used by teachers in trigonometry learning to determine the understanding of mathematical concepts.

These results are by the research results of Abdullah et al., (2023) which concluded that there were differences in learning outcomes between students who participated in RME learning and students who only participated in conventional learning. According to Dziuban et al. (2018), the RME model can create an effective learning environment, efficient communication, better access, and good learning evaluation. The findings of Surjono et al., (2017) showed that the implementation of RME provided more benefits to improve student achievement and active participation than traditional face-to-face learning and students had positive perceptions of the implementation of RME learning.

In this study, the preparation of RME learning activities is arranged based on four levels of RME activities: situation, model of situation, model for knowledge, and formal mathematics (Johar dkk., 2021). In the situation activity, learning begins by giving students real-life or contextual problems regarding the combination of food and beverage menus that can be selected. Contextual problems can motivate and support the development of students' problem-solving skills (Amalia dkk., 2024; Ariyanto dkk., 2020). In the model of situation activity, students build a model that functions to represent the contextual problem given. Then, in the model for knowledge stage, students begin to apply the model they have built more generally and in a more abstract form. Finally, in the formal mathematics stage, students use mathematical symbols and formal rules without linking them to the real-world context continuously.

At each of these four activity levels, predictions or assumptions are made regarding students' thoughts, responses, and understanding that may occur during the learning process. Based on these assumptions, anticipatory steps are then prepared for possible possibilities. This is in line with the statement of Nuriyah dkk. (2024) who revealed that making predictions can help to develop well-planned anticipatory steps so that teachers are better prepared to deal with various student thoughts and understandings and can create responsive learning that is centred on student needs.

CONCLUSIONS

The results of the Mann-Whitney test on the post-test value data of conceptual understanding showed a significance value of 0.000. This significance value is smaller than the significance level of $\alpha = 0.05$ so there is a significant difference in the average value of conceptual understanding between the experimental and control classes. Thus, students in the experimental class who received mathematics learning using RME-based HLT had better conceptual understanding than students in the control class who did not receive such learning.

The RME model can create an effective learning environment, efficient communication, better access, and good learning evaluation. The application of RME provides more benefits to improve student achievement and active participation than traditional face-to-face learning and students have a positive perception of the application of RME learning.

REFERENCES

Abdullah, W., Halim, A., & Ali, R. F. (2023). the Influence of Blended Learning on Learning Outcomes. *Gahwa*, *2*(1), 51–66.

Amalia, L., Makmuri, M., & Hakim, L. El. (2024). Learning Design: To Improve Mathematical Problem-Solving Skills Using a Contextual Approach. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *7*(3), 2353–2366. https://doi.org/10.54371/jiip.v7i3.3455

Arifin, Z., Mulyana, R. B., Sutresna, N., Subarjah, H., Sawali, L., Pratama, K. W., Sonjaya, A. R., Ali, S. K. S., Hasan, S. N., Hasan, S. N., Mustapha, A., Razali, M. N., Sutapa, P., Karakauki, M., & Hardianto, D. (2024). The effect of modification of movement in training on students' swimming competence. *Retos*, *51*, 949–954. https://doi.org/10.47197/RETOS.V51.101338

Ariyanto, L., Rahmawati, N. D., & Haris, A. (2020). Pengembangan Mobile Learning Game Berbasis Pendekatan Kontekstual Terhadap Pemahaman Konsep Matematis Siswa. *JIPMat: Jurnal Ilmiah Pendidikan Matematika*, *5*(1), 36–48. https://doi.org/10.26877/jipmat.v5i1.5478

Arizona, A., Nurlela, N., & Jannati, Z. (2019). Relaxation technique within group counseling to reduce student's anxiety on facing exam. *Islamic Guidance and Counseling Journal*, *2*(1), 33–39. https://doi.org/10.25217/igcj.v2i1.310

Batubara, I. H. (2017). Peningkatan Kemampuan Pemahaman Konsep Matematis Melalui Model Pembelajaran Berbasis Masalah Berbantuan Autograph Dan Geogebra Di Sma Freemethodist Medan. *MES: Journal of Mathematics Education and Science*, *3*(1), 47–54.

Darmawan, I. P. A., Octavianus, S., Ratri, W. S., Lesmi, K., Kiswara, Y. E., Souisa, L., Tauran, S. F., Uktolseja, L. J., Pudjiastuti, S. R., & Solikin, A. (2023). Metode Penelitian Pendidikan Praktis. In *Widiana Bhakti Persada Bandung*.

Dziuban, C., Graham, C. R., Moskal, P. D., Norberg, A., & Sicilia, N. (2018). Blended learning: the new normal and emerging technologies. *International Journal of Educational Technology in Higher Education*, *15*(1), 1–16. https://doi.org/10.1186/s41239-017-0087-5

Erlina, D. A., & Sutarni, S. (2024). Peningkatan Aktivitas Belajar Siswa Melalui Pembelajaran Realistic Mathematics Education (RME). *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *8*(1), 454–463. https://doi.org/10.31004/cendekia.v8i1.2409

Fahrudin, A. G., Zuliana, E., & Bintoro, H. S. (2018). Peningkatan Pemahaman Konsep Matematika melalui Realistic Mathematic Education Berbantu Alat Peraga Bongpas. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, *1*(1), 14–20. https://doi.org/10.24176/anargya.v1i1.2280

Fatkhurohmah, Susiyani, R., Kusyuliarto, Murtiyasa, B., & Setyaningsih, N. (2024). Peningkatan Pemahaman Konsep Matematika Materi Statistika Melalui Model Pembelajaran Kooperatif (NHT) di SDN Sampangan. *Jurnal Pendidikan: Kajian Dan Implementasi*, *6*(2), 190–200.

Fuadiah, N. F. (2017). H Ypothetical L Earning T Rajectory Pada Pembelajaran Bilangan H Ypothetical L Earning T Rajectory of Negative Numbers Based on Theory of. *Mosharafa*, *6*(1), 13–24. http://e-mosharafa.org/index.php/mosharafa

Gee, E. (2019). Kemampuan Pemecahan Masalah Matematika Melalui Alur Belajar Berbasis Realistic Mathematics Education (Rme). *Jurnal Education and Development*, *7*(3), 269–277.

Hendrik, A. I., Ekowati, C. K., & Samo, D. D. (2020). Kajian Hypothetical Learning Trajectories dalam Pembelajaran Matematika di Tingkat SMP. *Fraktal: Jurnal Matematika Dan Pendidikan Matematika*, *1*(1), 1–11. https://doi.org/10.35508/fractal.v1i1.2683

Indrapangastuti, D., Surjono, H. D., Sugiman, & Yanto, B. E. (2021). Effectiveness of the Blended Learning Model to Improve Students Achievement of Mathematical Concepts. *Journal of Education and E-Learning Research*, *8*(4), 423–430. https://doi.org/10.20448/journal.509.2021.84.423.430

Isnawan, M. G., & Wicaksono, A. B. (2018). Model Desain Pembelajaran Matematika. *Indonesian Journal of Mathematics Education*, *1*(1), 47. https://doi.org/10.31002/ijome.v1i1.935

Johar, R., Zubainur, C. M., Khairunnisak, C., & Zubaidah, T. (2021). *Membangun Kelas yang Demokratis Melalui Pendidikan Matematika Realistik*. Syiah Kuala University Press.

Kurniawaty, R., Makmuri, M., & Meiliasari, M. (2023). Pengembangan Pembelajaran

Dengan Pendekatan Pmri Untuk Meningkatkan Kemampuan Literasi Matematis Berbudaya Lokal Jakarta. *Symmetry: Pasundan Journal of Research in Mathematics Learning and Education*, *8*(2), 195–204. https://doi.org/10.23969/symmetry.v8i2.10809

Marmoah, S., & Istiyati, S. (2018). *Learning Trajectory to Improve Students ' Critical Thinking*. *July 2022*.

Nikitina, M. A., & Chernukha, I. M. (2022). Methods for Nonparametric Statistics in Scientific Research. Overview. Part 2. *Theory and Practice of Meat Processing*, *7*(1), 42–57. https://doi.org/10.21323/2414-438X-2022-7-1-42-57

Nuraida, I., & Amam, A. (2019). Hypothetical Learning Trajectory in Realistic Mathematics Education To Improve the Mathematical Communication of Junior High School Students. *Infinity Journal*, *8*(2), 247–258. https://doi.org/10.22460/infinity.v8i2.p247-258

Nuriyah, K., M, A. H. A. R., Thohir, P. F. D. M., Rusdiah, N., & Sari, K. W. (2024). Adaptasi Strategi Pembelajaran Responsif terhadap Dinamika Siswa. *Jurnal Basicedu*, *8*(5), 3843–3851. https://doi.org/10.31004/basicedu.v8i5.8674

Pujiastuti, H., & Haryadi, R. (2023). Enhancing mathematical literacy ability through guided inquiry learning with augmented reality. *Journal of Education and E-Learning Research*, *10*(1), 43–50. https://doi.org/10.20448/jeelr.v10i1.4338

Qondias, D., Lasmawan, W., Dantes, N., & Arnyana, I. B. P. (2022). Effectiveness of Multicultural Problem-Based Learning Models in Improving Social Attitudes and Critical Thinking Skills of Elementary School Students in Thematic Instruction. *Journal of Education and E-Learning Research*, *9*(2), 62–70. https://doi.org/10.20448/JEELR.V9I2.3812

Rezky, R., & Wijaya, A. (2018). Designing hypothetical learning trajectory based on van hiele theory: A case of geometry. *Journal of Physics: Conference Series*, *1097*(1). https://doi.org/10.1088/1742-6596/1097/1/012129

Schaathun, H. G. (2022). On Understanding in Mathematics. *Teaching Mathematics and Its Applications*, *41*(4), 318–328. https://doi.org/10.1093/teamat/hrac016

Simon, M. A., Tzur, R., Heinz, K., & Kinzel, M. (2004). Explicating a mechanism for conceptual learning: Elaborating the construct of reflective abstraction. *Journal for Research in Mathematics Education*, *35*(5), 305–329. https://doi.org/10.2307/30034818

Surjono, H. D., Muhtadi, A., & Wahyuningsih, D. (2017). The Implementation of Blended Learning in Multimedia Courses for Undergraduate Students in Indonesia. *International Journal of Information and Education Technology*, *7*(10), 783–786. https://doi.org/10.18178/ijiet.2017.7.10.972

Sutarni, S., & Aryuana, A. (2023). Realistic Mathematics Education (RME): Implementation of Learning Models for Improving HOTS-Oriented Mathematics Problem-Solving Ability. *AL-ISHLAH: Jurnal Pendidikan*, *15*(2), 1213–1223. https://doi.org/10.35445/alishlah.v15i2.2127

Suwarto, S., & Purnami, A. S. (2018). Upaya Meningkatkan Pemahaman Konsep Matematika Melalui Hypothetical Learning Trajectory Pada Materi Vektor. *IndoMath: Indonesia Mathematics Education*, *1*(2), 69.

https://doi.org/10.30738/indomath.v1i2.2614

Wandanu, R. H., & Wandanu, Abdul Mujib, F. (2020). *Hypothetical Learning Trajectory al Learning Tr jectory Berbasis Pendidikan Matematika Realistik Untuk Mengembangkan Kemampuan Pemecahan Masalah Matematis Siswa*. *3*(2), 8–16.

Yesi Gusmania, N. A. (2020). Analisis Kemampuan Pemahaman Konsep Matematis Mahasiswa Pada Mata Kuliah Kalkulus Ii. *PHI: Jurnal Pendidikan Matematika*, *4*(2), 85. https://doi.org/10.33087/phi.v4i2.104

Yudhani, A. S. (n.d.). *Eksplorasi Strategi Belajar Siswa Berprestasi Dalam Pembelajaran Matematika Siswa SD Eksplorasi Strategi Belajar Siswa Berprestasi Dalam Pembelajaran Matematika Siswa SD*. *4*(2), 1535–1545.