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THE EFFECT OF REALISTIC MATHEMATICS LEARNING APPROACH ON CONCEPTS OF UNDERSTANDING

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Abstract

Students' understanding of concepts in mathematics learning is still having difficulties. The purpose of this study was to determine the effect of realistic mathematics approaches on students' understanding of the SPLDV concept. This research conducted an experimental research design with one group pretest-posttest design. This research took the data at Junior High School SMP Bahrul Maghfiroh Malang. The data were collected by using the written test technique. The data analysis was quantitative analysis which focused on descriptive statistics and inferential statistics. The results of this study stated that there was a better effect of learning with a realistic mathematics approach in improving students' understanding of the SPLDV concept. Students look more relaxed in participating in learning.

Kata Kunci: Matematika Realistik; Pemahaman Konsep , SPLDV

Abstrak

Pemahaman konsep siswa dalam pembelajaran matematika masih mengalami kesulitan. Tujuan penelitian ini adalah untuk mengetahui pengaruh pendekatan matematika realistik terhadap pemahaman konsep SPLDV siswa. Penelitian ini merupakan

penelitian eksperimental dengan rancangan one group pretest-posttest design. Penelitian ini mengambil data di Sekolah Menengah Pertama SMP Bahrul Maghfiroh Malang. Pengumpulan data dilakukan dengan teknik tes tertulis. Analisis data adalah analisis kuantitatif yang difokuskan pada statistik deskriptif dan statistik inferensial. Hasil penelitian ini menyatakan bahwa pembelajaran dengan pendekatan matematika realistik terdapat pengaruh yang lebih baik dalam meningkatkan pemahaman konsep SPLDV siswa. Siswa terlihat lebih santai dalam mengikuti pembelajaran
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INTRODUCTION

One of the subjects that support the development of science and technology is mathematics subject. Mathematics plays an important role in everyday life. Mathematics as science also has a very important role in education because almost all educational sciences conduct mathematics. The role of mathematics is as a thinking tool to lead students to understand mathematical concepts learned in everyday life (Hazrati et al., 2020). Meanwhile, the objectives of mathematics in the current curriculum are to understand mathematical concepts, explain the relationship between concepts and apply concepts in a flexible, precise, efficient, and precise manner in solving problems (Dinni & Isnarto, 2018).

The main problem that is often faced in mathematics education is the low ability of students to understand concepts. The concept relates to the foundation for students to understand the material provided by the teacher so the students can prove it correctly according to their understanding (Rosdianto et al., 2017). Concept development in children takes place in several phases over a certain age range. According to Piaget (Biskup, 2011), the transition from simple concepts to more complex concepts, concepts also move from abstract and general to more specific concepts. A student must have a good understanding of concepts if they want to understand mathematics deeply (Andamon & Tan, 2018).

Understanding the concept is an important component of the abilities to be mastered by students (Harta et al., 2014). According to Burns et al., (2015), conceptual understanding is recognizing and understanding the core ideas that underlie a subject such as relationships and reasons that underlie mathematical problems in a particular area. A student has an understanding of the concept if they have grasped the meaning or meaning of a concept (Purwanti et al., 2016). Understanding mathematical concepts are knowledge that involves a thorough understanding of the underlying and basic concepts behind algorithms carried out in mathematics (Andamon & Tan, 2018). For students to develop mathematical skills, students must have a deep understanding of mathematical concepts and their relationship in everyday life (Suweken et al., 2017). The ability to understand concepts can be used

as a basis for measuring the extent to which the material being studied can be mastered well.

There are several important aspects of conceptual understanding, namely: (1) inviting students to use manipulatives to model concepts, then expressing the results, helping them to understand abstract ideas; (2) making students show different representations of the same mathematical situation; (3) making students use previous knowledge to be used in new knowledge; (4) making students know the relationship between mathematics that has been learned and what students already know (Suweken et al. al., 2017). Meanwhile, according to Eggen & Kauchak (2012) students' knowledge and understanding of a concept could be measured by asking students some points: 1) defining a concept, (2) identifying the characteristics of the concept, 3) connecting one concept to other concepts, and 4) identifying or provide examples of concepts that have never been encountered before. It could be concluded that if students understand a concept, it means that students understand a certain design or abstract idea/concept that is being studied correctly.

Based on the results of observations and interviews with 8th-grader teachers of SMP Bahrul Maghfiroh Malang, the problem faced was the lack of understanding of students' concepts in mathematics learning. The interaction between students to students and students to teachers was not going well. The ability of students to rewrite mathematical ideas in writing is still lacking. Based on the results of the student daily assessment, the students' conceptual understanding data was obtained at 40%. It means the students could understand the concept. Meanwhile, there are 60% of the other students had not been able to understand the concept. Most students have not been able to understand mathematical concepts and some students have to learn again. It requires more time and effort. Mathematics is an abstract discipline, therefore the students have difficulty understanding mathematical concepts (Andamon & Tan, 2018). Thus, it is necessary to apply mathematical concepts related to students' daily lives, so that it makes it easier for students to understand concepts.

The success of understanding the concepts is influenced by several factors, one of which is the use of a learning approach (Sagala et al., 2019). If the teachers want to teach something to students well and successfully, the first thing to pay attention to is the teaching method or teaching approach therefore the expected goals could be achieved properly. The teaching method or teaching approach has a function as a tool to achieve learning objectives. Thus, the appropriate teaching method is needed to achieve the goal to be more effective and efficient. One of the mathematics lessons that are oriented in everyday life is realistic mathematics learning.

The realistic mathematics education (RME) approach in Indonesia is known as Realsitic Mathematics Education (PMR) approach, which was first introduced and developed in the Netherlands (Lestari et al.,

2016; Azmi et al., 2018). The realistic mathematics learning model is alternative learning that requires students to construct knowledge with their abilities through their activities in learning activities (Susanti & Rustam, 2018). RME is defined as an approach that teaches mathematical concepts based on student experience so that it becomes stable and meaningful (Syarif et al., 2019). The main objective of a realistic mathematics approach is that students should be allowed to rediscover mathematical ideas and concepts with adult guidance (Hazrati et al., 2020). In RME, context problems are the basis for mathematical processes (Güler, 2018). It means that realistic mathematics must be close to the daily situation of students with the guidance of adults or teachers.

The RME approach guides students to acquire meaningful knowledge so that the students feel familiar with mathematics and generate interest and motivation in mastering the material (Afthina et al., 2017). Basically, realistic mathematics learning is the use of reality and the environment that students understand to facilitate the learning process of mathematics to achieve better mathematics education goals than in the past (Herawaty & Rusdi, 2016). According to Arends (Afthina et al., 2017), the steps of the RME approach are carried out in four stages, namely understanding contextual problems, solving contextual problems, comparing and discussing answers, and concluding. This approach emphasizes student activity and not passivity (Hasbi et al., 2019). Therefore students are not seen as passive recipients but must be allowed to rediscover mathematical concepts under the guidance of the teacher.

There are several studies have been conducted on the effect of a realistic mathematics approach. Research conducted by Muchlis (2012) claimed that the mathematics problem-solving abilities of students who learn with the PMRI approach are significantly better than the conventional approach. Meanwhile, Wibowo (2017) found that the real learning approach is more effective than the scientific approach to learning achievement, mathematical reasoning abilities, and interest in learning. This study would be focused on the influence of a realistic mathematics approach on students' understanding of the SPLDV concept.

Based on the description above, the problem of understanding student concepts is very interesting. The researcher examines more about the realistic mathematical approach to understanding student concepts. Hopefully, the results of this study can be used as references for the teacher in determining methods or approaches to learning mathematics in class. Based on the above background, the researchers established a statement of the problem as follow: Is there any effect of a realistic mathematics approach on the understanding of the SPLDV concept of grade VIII students of SMP Bahrul Maghfiroh Malang?

METHODS

This study conducted the experimental method which focused on pre-experimental research design, namely One Group Pretest-Postest. A pretest is given by mathematics

learning achievement test to obtain a preliminary score before applying the realistic mathematics learning approach (PMR). A posttest is given to measure student scores after being given the realistic mathematics approach (PMR) treatment. Furthermore, the pretest and posttest scores will be compared to analyze if there are differences in students' understanding of the SPLDV concept after and before using the approach (PMR). The research design can be seen below.

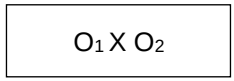

Figure 1. Research Design

Keterangan:

O_1 = Pretest Score (Before the treatment)

O_2 = Postest Score (After the treatment)

X = *treatment*

This research was conducted at SMP Bahrul Maghfiroh Malang in the odd semester of the 2019/2020 period. The population in this study were students of 8th grades at SMP Bahrul Maghfiroh Malang as many as 3 classes totaling 93 people. The sampling technique used was cluster random sampling by taking members of the sample from the population randomly using a lottery from the students at 8th grades A class, B class, and C class. The class was selected to be the experimental class was class B class which totaling 32 students.

The data collection technique used was a written test technique. The test was given to determine scores before and after the treatment of the realistic mathematics learning approach (PMR) to students' understanding of concepts. The instrument used in the study was in the form of description questions that were given during the pretest and posttest in the experimental class. This test was given to obtain data about students' understanding of mathematical concepts. To understand students' understanding of mathematical concepts, it can be seen from the tests carried out after using the PMR approach.

The content validity is used in this study. It is intended to check whether the instrument items represent the indicators to be achieved. The validators were lecturers and subject teachers in the research schools. The reliability test was carried out only to see the consistency of the suggestions given by lecturers and subject teachers. The inter-rater agreement test is needed to compare and know the consistency between two experts by measuring the Kappa index.

The data analysis technique was a quantitative analysis using descriptive statistics and inferential statistics. Data from the pretest and posttest results were analyzed using descriptive statistics, including maximum, minimum, mean, variance, and n-gain values. Inferential statistics also were used to analyze the

research hypothesis. Hypothesis testing consists of testing using parametric and non-parametric statistics. The parametric normality test was conducted. There are paired data that are needed to use the z-test hypothesis test. The z test is used to prove whether the application of the realistic mathematics learning approach affects concept understanding as seen from the pretest and posttest scores.

RESULTS AND DISCUSSION

1. Data Description

The test that was used at the pretest was in the form of a description test consisting of 5 items. From those could be concluded that the class average score was 40.31. It was less than the highest score of 56 and the lowest of 16. This shows that students have not understood the SPLDV material that has been taught so 32 students do not understand the concept of SPLDV well. The description of the data on the results of the pretest and posttest as representatives of students who received the lowest and highest scores based on each indicator of conceptual understanding would be presented in Table 1 below:

Table 1. Data on the Understanding of the SPLDV Concept

Indicators	Pretest		Posttest	
	Students' Score		Students' Score	
	Min	Max	Min	Max
Knowing	6	6	8	8
Understanding	0	4	8	8
Applying	2	18	18	43
Raw Score	8	28	34	59
Standard Score	16	56	57	98

Based on Table 1, from the table can be concluded that the lowest pretest score of the students who had 16 standard scores, obtained the indicator of knowing question number 1. The students got 6 scores because students can solve the number questions properly and correctly. However, from the indicators of understanding, the questions number 2 and 3, they got 0 scores because the students did not complete all questions at the pretest. Furthermore, from these results, it can be stated that students have not been able to understand the SPLDV concept. Meanwhile, the indicator of applying in the question number 4 and 5, the students got 2 scores because they only complete what they understood. The graphical method also shows that students have not been able to apply the SPLDV concept well.

For some students who received the highest score on the pretest based on table 1, it can be determined that they got the highest score at the pretest with 56 standard scores that were obtained from the indicator of knowing in question number 1. The students got 6 scores because students can solve the number question correctly. Whereas for questions numbers 2 and 3 on

understanding indicators, they got 4 scores because they can solve the number questions properly and correctly. Question numbers 4 and 5 could be shown that they got 18 scores from the applying indicators because they only complete partial solutions, However, only at question number 4 students are able to apply the SPLDV concept using the graphic method. Meanwhile, the students cannot answer the questions by using other methods. Thus, it can be concluded that in the pretest questions students are only able to understand the SPLDV concept on the indicators of knowing and understanding. For the indicators of applying the SPLDV concept, they have not been able to complete it well.

The results of the posttest based on table 1, can be stated that the lowest posttest score of students with a standard value of 57 can be seen at question number 1 with the indicators of knowing. The students got 8 scores because they can solve the number question properly and correctly. For questions number 2 and 3, it can be concluded that the indicator of understanding got 8 scores because students can complete it well and correctly. Furthermore, numbers 4 and 5 showed that they got 18 scores on the indicator of understanding because they only solve question number 4 and only partial completion. It because the students were only able to apply the SPLDV concept using the graphic method only, which means that students have not been able to apply the SPLDV concept to several other methods correctly.

Based on Table 1, it showed that the highest score at the posttest the students got 98 standard scores which the question number 1 at the indicators of knowing got 8 scores. It because students can solve the number questions correctly. In questions number 2 and 3, they showed that the indicator for understanding got 8 scores because students can solve the number questions correctly. Whereas for questions numbers 4 and 5 with the indicators of applying, they got 43 scores. It means students can apply the SPLDV concept well but the completion is not quite right at the conclusion of the mixed method. In the post-test questions, the students are able to understand the concept of the SPLDV regarding the indicators of knowing, understanding, and applying very well. It can be concluded that there is an effect of students 'understanding of the SPLDV concept seen from the results of the standard score of pre-test and post-test. The students understand the SPLDV concept by applying the SPLDV concept using daily life.

a. Data on Students' SPLDV Concept Understanding

The data below are the pre-test and post-test of students' understanding of the SPLDV concept. 32 students represented the data.

Table 2. Results of Students' Understanding of the SPLDV Concept

No	Statistic	Statistic Score	
		Pretest	***Posttest***
1.	Number of Samples	32	32
2.	Max	56	98
3.	Min	16	57
4.	Mean	40,31	81,71
5.	Median	41	81,67
6.	Variance	98,867	147,835
7.	Standard Deviation	9,943	12,159
8	Range	40	41

Based on Table 2, showed that the pre-test the means score is still low. Means scores reached 40.31 while the highest score on 56. This also showed that students have less understood of the SPLDV concept that has not been taught using the PMR approach. 32 students had not fully understood the concept yet. While the results of the post-test calculation show that the average score is above the median value of 81.71. It indicated that there are no students whose score is too low. It is known that the lowest score is 57 and the highest score is 98 and the students got the pre-test range score of 40 while the post-test score is 41. Based on the pre-test and post-test scores obtained, it showed that the mean score of students has increased. This shows that students' understanding of the SPLDV concept has increased after the realistic mathematics learning approach is applied.

b. N-gain data

By looking at the criteria for increasing students' understanding of the SPLDV concept by applying a realistic mathematical approach, the gain score was calculated. Based on 40.31 for average pre-test score and 81.71 for average post-test score and 100 for the maximum score, the gain score was 0.69. It showed that the students' understanding of the SPLDV concept is in the medium category. In the calculation of the gain score, it was obtained that 2 students were in the low criteria or 6.25%. Meanwhile, the students who were in the medium category were 15 students or 46.875% and students who were in the high category were 15 students or 46.875%. Thus, it can be concluded that there is a significant difference in the students' understanding of the SPLDV concept at the pretest and posttest.

2. Hypothesis test

a. Data Normality Test

The data normality test used the Kolmogorov-Smirnov Z method through the SPSS 20 software program. The results of the pre-test and post-test data normality test for students' understanding of the SPLDV concept can be seen in Table 3 below

Tabel 3.The Result of Normality Test

Data	Number of Students	*Kolmogorov-Smirnov Z*	
		Df	***Asymp. Sig***
Pretest	32	31	0,401
Posttest	32	31	0,822

Based on Table 3, by looking at the Asymp. Sig score, the pretest and posttest data sig is greater than 0.05 it means H_0 is accepted. Thus, it can be concluded that the data are distributed normally.

b. Hypothesis testing

After doing the prerequisite test and the data were normally distributed, the hypothesis was tested. Hypothesis testing in this study using the z test. The following table is the results of the z test calculation.

Tabel 4. Z test Result

Statistic	Result
$\bar{d}$	41,50
D_0	0
S_d	14,041
N	32
Z_{score}	16,733
Z_{table}	1,645

Based on the calculation of the hypothesis test Based on the results of the calculation of the hypothesis test in Table 4, it shows that $Z_{hitung} > Z_{tabel}$ $(16{,}733 > 1{,}645)$, it can be said that H_0 is rejected and H_a is accepted. So it can be concluded that there is an effect of applying a realistic mathematics approach to students' understanding of the SPLDV concept.

Based on the research results above from the calculation of the pretest results, showed that students have lack understanding of the SPLDV concept. Since the teacher starts to apply a realistic mathematics approach to the learning process. At the beginning of the lesson, most students felt confused, but over time the students began to be actively involved in the learning process. The final post-test result has increased significantly. Students look more relaxed and fluent in the process of working on post-test questions. Learning activities with the application of a realistic mathematics approach can improve students' understanding of the SPLDV concept better than before. This is in line with the research of Herwanto et al., (2020) that there is a positive effect of the PMR approach on the ability to understand mathematical concepts and students' learning independence. In line with the above research conducted by Jeheman et al., (2019), claimed that the use of a realistic mathematics approach in mathematics learning affects students' conceptual understanding.

This is because the learning approach to realistic mathematics is close to the daily lives of students and student activities are more emphasized on finding, explore, and building the necessary knowledge themselves so that learning becomes student-centered. This is in accordance with the opinion of Herwanto et al., (2020) that PMR emphasizes the process of student involvement to be able to explore the material being studied that is related to real life. so that it can make mathematics more interesting, relevant, and meaningful, not too formal, and not very abstract. In line with the above, Herawaty & Rusdi (2016) argue that learning by utilizing the real world and an environment close to students can facilitate the learning process of mathematics.

CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that there is a better effect of learning with a realistic mathematics approach in increasing students' understanding of the SPLDV concept. Students look more relaxed in participating in learning, even though students have a little difficulty at the beginning of learning. As an implication, it is hoped that the teachers can use realistic mathematics learning in mathematics learning so the students' understanding of concepts can be linked in everyday life.

SUGGESTION

For further research, a realistic mathematics approach can be related to students 'logical-mathematical intelligence or students' cognitive styles in understanding mathematical concepts.

REFERENCES

Afthina, H., Mardiyana, & Pramudya, I. (2017). The Comparison of Think Talk Write and Think Pair Share Model with Realistic Mathematics Education Approach Viewed from Mathematical-Logical Intelligence. *International Journal of Science and Applied Science: Conference Series*, *2*(1), 181–189. https://doi.org/10.20961/ijsascs.v2i1.16706

Andamon, J. C., & Tan, D. A. (2018). Conceptual Understanding, Attitude and Performance in Mathematics of Grade 7 Students. *International Journal of Scientific and Technology Research*, *7*(8), 96–105.

Azmi, A. L., Wardono, & Cahyono, A. N. (2018). Mathematics Literacy on Creative Problem Solving with Realistic Mathematics Education Approach Assisted by e-Learning Schoology. *Unnes Journal of Mathematics Education*, *7*(3), 188–194. https://doi.org/10.15294/ujme.v7i1.24472

Biskup, K. J. (2011). A Comparative Study of Concept Understanding In Polish Congenitally Totally Blind And Sighted Children. *Psychology of Language and Communication*, *15*(1), 27–48. https://doi.org/10.2478/v10057-011-0002-4

Burns, M. K., Walick, C., Simonson, G. R., Dominguez, L., Harelstad, L., Kincaid, A., & Nelson, G. S. (2015). Using a Conceptual Understanding and Procedural Fluency Heuristic to Target Math Interventions With Students in Early Elementary. *Learning*

Disabilities Research & Practice, *30*(2), 52–60. https://doi.org/10.1111/ldrp.12056

Dinni, H. N., & Isnarto. (2018). Mathematical Connection Abilities and Self-Esteem of Students on Model-Eliciting Activities Learning with a Realistic Approach. *Unnes Journal of Mathematics Education Research*, *7*(2), 161–166.

Eggen, P., & Kauchak, D. (2012). *Strategi dan Model Pembelajaran Mengajarkan Konten dan Keterampilan Berpikir Edisi Keenam*. PT. Indeks. https://doi.org/10.20527/edumat.v3i1.630

Güler, H. K. (2018). Activities Written by Prospective Primary Teachers on Realistic Mathematics Education. *International Journal of Evaluation and Research in Education (IJERE)*, *7*(3), 229–235. https://doi.org/10.11591/ijere.v7.i3

Harta, I., Tenggara, S., & Kartasura, P. (2014). Pengembangan Modul Pembelajaran untuk Meningkatkan Pemahaman Konsep dan Minat SMP. *PYTHAGORAS: Jurnal Pendidikan Matematika*, *9*(2), 161–174. https://doi.org/10.21831/pg.v9i2.9077

Hasbi, M., Lukito, A., & Sulaiman, R. (2019). Mathematical Connection Middle-School Students 8th in Realistic Mathematics Education. *Journal of Physics: Conference Series*, *1417*(1), 1–8. https://doi.org/10.1088/1742-6596/1417/1/012047

Hazrati, K., Minarni, A., & Rajagukguk, W. (2020). Differences in Mathematic Connection Abilities and Self-Efficacy between Students Given Approaches Realistic Mathematics with the Approach Inquiry at Senior High School 2 Tanjung Morawa. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, *3*(3), 1489–1500. https://doi.org/10.33258/birle.v3i3.1222

Herawaty, D., & Rusdi, R. (2016). Increased Capacity of the Understanding of the Concept and the Ability To Solve Problems Through the Implementation of the Model of Teaching Mathematics Realistic Based on Cognitive Conflict Students. *Infinity Journal*, *5*(2), 109. https://doi.org/10.22460/infinity.v5i2.217

Herwanto, H., Karnasih, I., & Mujib, A. (2020). Pengaruh Pendekatan Pembelajaran Matematika Realistik (PMR) terhadap Kemampuan Pemahaman Konsep Matematis dan Kemandirian Belajar Siswa SMP. *EDUMASPUL*, *4*(2), 72–77.

Jeheman, A. A., Gunur, B., & Jelatu, S. (2019). Pengaruh Pendekatan Matematika Realistik terhadap Pemahaman Konsep Matematika Siswa. *Mosharafa: Jurnal Pendidikan Matematika*, *8*(2), 191–202. https://doi.org/10.31980/mosharafa.v8i2.454

Lestari, I., Prahmana, R. C. I., & Wiyanti, W. (2016). Peningkatan Kemampuan Penalaran Matematis Siswa Menggunakan Pendekatan Pendidikan Matematika Realistik. *The Journal of Innovation in Elementary Education*, *1*(2), 45–50.

Muchlis, E. E. (2012). Pengaruh Pendekatan Pendidikan Matematika Realistik Indonesia (PMRI) Terhadap Perkembangan Kemampuan Pemecahan Masalah Siswa Kelas II SD Kartika Padang. *Jurnal Exacta*, *10*(2), 136–139.

Purwanti, R. D., Pratiwi, D. D., & Rinaldi, A. (2016). Pengaruh Pembelajaran Berbantuan GeoGebra Terhadap Pemahaman Konsep Matematis ditinjau dari Gaya Kognitif. *Al-Jabar: Jurnal Pendidikan Matematika*, *7*(1), 115–122.

https://doi.org/https://doi.org/10.24042/ajpm.v7i1.137

Rosdianto, H., Murdani, E., & Hendra. (2017). Implementasi Model Pembelajaran POE (Predict Observe Explain) Untuk Meningkatkan Pemahaman Konsep Siswa Pada Materi Hukum Newton. *Jurnal Pendidikan Fisiska*, *6*(1), 55–58. https://doi.org/10.31227/osf.io/tv928

Sagala, R., Umam, R., Thahir, A., Saregar, A., & Wardani, I. (2019). The Effectiveness of STEM-Based on Gender Differences: The Impact of Physics Concept Understanding. *European Journal of Educational Research*, *8*(3), 753–761. https://doi.org/10.12973/eu-jer.8.3.753

Susanti, G., & Rustam, A. (2018). The Effectiveness of Learning Models Realistic Mathematics Education and Problem Based Learning Toward Mathematical Reasoning Skills At Students of Junior High School. *Journal of Mathematics Education*, *3*(1), 33–39. https://doi.org/10.31327/jomedu.v3i1.534

Suweken, G., Waluyo, D., & Okassandiari, N. L. (2017). The Improvement of Students' Conceptual Understanding and Students' Academic Language of Mathematics through the Implementation of SIOP Model. *International Research Journal of Management, IT and Social Sciences*, *4*(4), 58–69. https://doi.org/10.21744/irjmis.v4i4.519

Syarif, M. I., Taufik, T., Fauzan, A., & Irdamurni. (2019). Development of Local Instruction Theory Topics Lowest Common Multiple and Greatest Common Factor Based on Realistic Mathematics Education in Primary Schools. *Journal Education and Development*, *7*(2), 17–23. https://doi.org/10.24036/ijeds.v1i1.59

Wibowo, A. (2017). Pengaruh Pendekatan Pembelajaran Matematika Realistik dan Saintifik Terhadap Prestasi Belajar, Kemampuan Penalaran Matematis dan Minat Belajar.*Jurnal Riset Pendidikan Matematika*, *4*(1), 1–10. https://doi.org/10.21831/jrpm.v4i1.10066