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Situation Based Learning with Peer Tutors Design in Mathematics Learning

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Abstract: This study aims to determine student responses to the application of the situation based learning model with peer tutors. The method used in this research is descriptive qualitative method, with data sources consisting of primary data sources and secondary data. The research subjects consisted of 29 students. The research instrument was in the form of observation sheets and student response questionnaires consisting of 4 indicators containing 20 statements. The data analysis technique was carried out through the stages of data reduction, data presentation, and drawing conclusions. Based on the results of the study, it was found that the application of the situation based learning model with peer tutors was carried out very well and overall received a positive response from students. Students gave positive responses to indicators of interest in mathematics, interest in learning mathematics using a situation based learning model with peer tutors, and the benefits of participating in mathematics learning using a situation based learning model with peer tutors. A very positive response was given by students on the indicators of the benefits of mathematics lessons.

Keywords: students' response, situation based learning, peer tutor.

Abstrak: *Penelitian ini bertujuan untuk mengetahui respon siswa terhadap penerapan model situation based learning dengan tutor sebaya. Metode yang digunakan dalam penelitian ini adalah metode deskriptif kualitatif, dengan sumber data terdiri dari sumber data primer dan data skunder. Subjek penelitian terdiri dari 29 siswa. Instrumen penelitian berupa lembar observasi dan angket respon siswa yang terdiri dari 4 indikator yang memuat 20 pernyataan. Teknik analisis data dilakukan melalui tahapan reduksi data, penyajian data, dan penarikan kesimpulan. Berdasarkan hasil penelitian diketahui bahwa penerapan penerapan model situation based learning dengan tutor sebaya terlaksana dengan sangat baik dan secara keseluruhan mendapatkan respon yang positif dari siswa. Siswa memberikan respon positif pada indikator minat terhadap pelajaran matematika, minat terhadap pembelajaran matematika menggunakan model situation based learning dengan tutor sebaya, serta manfaat mengikuti pembelajaran matematika menggunakan model situation based learning dengan tutor sebaya. Respon sangat positif diberikan siswa pada indikator manfaat pelajaran matematika.*

Kata kunci: *respon siswa, pembelajaran berbasis situasi, tutor sebaya.*

▪ INTRODUCTION

Mathematics is a field of study that is taught at all levels of education, from elementary school to college, even informally taught in early childhood education (Rahmawati & Kusuma, 2019). According to Golji & Dangpe in Celik (2018) mathematics plays a very important role in the development of science and technology that can be applied in everyday life. Mathematics is one of the sciences that can train students to think logically, critically and creatively (Hasanah & Purwasih, 2022). Learning mathematics is very important to foster a systematic, consistent way of thinking, and train students to be able to solve problems confidently and responsibly (Hendriana, 2014). Mathematics learning given in schools should use a learning model that is tailored to the needs, abilities, and backgrounds of students, the abilities and

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backgrounds of teachers and the goals to be achieved (Ulfa & Saifuddin, 2018). Learning that is packaged well and attractively can increase students' interest, motivation, and curiosity (Lestari, Andinny, & Mailizar, 2019). Therefore, teachers need to choose the learning model that is most appropriate to the student's condition.

The learning model is a plan of learning activities with a certain syntax in order to achieve certain goals (Alimah & Marianti, 2016). The learning model is a design pattern that describes the interaction process between students and teachers, which refers to the learning syntax from beginning to end by applying various ways of teaching and learning activities to achieve learning objectives. The learning design includes approaches, strategies, methods, and techniques in the learning process (Isrok'atun & Rosmala, 2018). The development of learning models is carried out situationally by considering the characteristics of students, materials, classes and learning environments. Teachers need to understand the learning model used so that learning can run effectively and efficiently, and make the learning process more focused. One of the learning models that can be applied in learning mathematics is situation based learning.

Situation based learning (SBL) is a constructivist learning model to build concepts by studying what is contained in a situation (Isrok'atun & Rosmala, 2018). There are 4 stages in the situation based learning model, namely 1) creating mathematical situations; 2) posing mathematical problems; 3) solving mathematical problems; and 4) applying mathematics. Creating mathematical situations is a prerequisite, posing mathematical problems is the core, solving mathematical problems is the goal, and applying mathematics is the application of the learning process to new situations (Isrok'atun & Tiurlina, 2014). According to Ramdan, Hanifah, & Isrok'atun in Hasanah, Priatna, & Yulianti (2021) situation based learning aims to develop students' abilities including problem posing, problem understanding, reasoning, communication, and problem solving from a mathematical point of view. Students are required to be able to think actively during learning with the SBL model in progress.

Situation based learning is one of the student-centered learning models, this is because students can learn from the situations presented by the teacher (Lestari et al., 2019). According to Junedi & Susanti (2020) by applying situation based learning mathematics learning will be more interactive, students will actively participate in the learning process because learning materials are directly related to situations and contexts of everyday problems. Student participation in the form of compiling questions related to problems in the existing situation. Utari, Kartasasmita, & Julika (2019) stated that situation based learning makes students more enthusiastic in participating in the learning process, this can be seen from active involvement in group work, asking questions, active responses to groups and confidence in facing exams. Situation based learning can train students to work together and become peer tutors, because SBL is implemented in groups (Larawati, Isrok'atun, & Gusrayani, 2016). The SBL model can take place in a more focused manner if it is assisted by students who have the ability to understand the material better, this is where the role of peer tutors is needed.

A peer tutor is someone appointed by the teacher to assist the teacher in guiding classmates both in group discussion activities and during the learning process (Wali, Winarko, & Murniasih, 2020). The tutors are taken from groups of students with higher academic achievement. This is in line with the opinion of Ahdiyat & Sarjaya (2014) which states that those who are chosen to be peer tutors are students with higher

abilities among their classmates. The SBL model with peer tutors is expected to be able to foster students' enthusiasm to learn to understand the material. Wali et al. (2020) stated that learning facilitated by their own friends will make students participate in learning activities more flexibly, because students will be more flexible to manage learning time, learning objectives, and the expected target of mastery of the material.

After teaching and learning activities are carried out, there needs to be reflection. Through reflection activities, teachers can find out student responses after carrying out learning activities (Chang, 2019). The results of these reflections can then be taken into consideration for improvement in designing learning in the future. One of the outcomes of reflection activities can be a response from students to the model used during the learning process (Humaidi, Qohar, & Rahardjo, 2022). There is a need for research on how students respond to the application of the situation based learning model combined with peer tutors.

▪ METHOD

Research Design and Procedures

The method used in this study is a quantitative descriptive method with the aim of knowing student responses to the application of the situation based learning model combined with peer tutors. This research was conducted at SMAN 1 Mantup in the academic year 2022/2023. Data sources consist of primary and secondary sources. Primary sources come from observation sheets and response questionnaires, while secondary sources are journals, books, and other related sources. The study began with the application of the SBL model with peer tutors and observations were made during the learning process, then students were given a response questionnaire or a list of statements with predetermined indicators. The data analysis step is done by data reduction, data presentation, and drawing conclusions.

Participants

The research subjects consisted of 29 students of class X 1 at SMAN 1 Mantup in the academic year 2022/2023. The selection of research subjects was done by simple random sampling technique. The simple random sampling technique was chosen because the subject of the population was taken randomly without regard to the strata in the population (Sugiyono, 2021). The situation based learning model with peer tutors was given to the experimental class with the following research design

O_1	**X**	**O_2**

Description:
O1 : class before being given treatment
X : SBL with peer tutors treatment
O2 : class after being given treatment

Research Instruments

The research instrument was in the form of observation sheets and student response questionnaires. The observation sheet contains 28 statements related to the learning process which consists of 3 stages, while the response questionnaire consists of 4 indicators containing 20 statements. These indicators include students' interest in

mathematics, the benefits of learning mathematics, interest in learning mathematics using a situation based learning model with peer tutors, and the usefulness of participating in mathematics learning using a situation based learning model with peer tutors. Each indicator consists of positive and negative statements with answer choices of STS (Strongly Disagree), TS (Disagree), S (Agree) and SS (Strongly Agree). Student response questionnaire scores refer to Table 1.

Table 1. Student response questionnaire scores

Category Student Answers	Score for Statement	
	Positive	Negative
STS (Strongly Disagree)	1	4
TS (Disagree)	2	3
S (Agree)	3	2
SS (Strongly Agree)	4	1

▪ RESULT AND DISSCUSSION

Situation based learning with peer tutors is a modified situation based learning model with peer tutors. Peer tutors are tasked with accompanying, directing and assisting students in their groups during learning activities. Peer tutors in the situation based learning model play a role in helping the development of students' thinking skills, students are trained to be able to analyze and solve existing problems with the help of tutors who have higher abilities and understanding. The steps taken by the teacher in SBL learning with peer tutors consist of three stages, namely the preparation, implementation, and evaluation stages with a learning design as shown in Figure 1.

In the preparation stage the teacher makes learning materials on one subject in the form of student worksheets containing illustrations of mathematical situations (creating mathematical situations) then appoints students as peer tutors and provides training for peer tutors regarding the material and design of the learning process. Next, the teacher groups the students into groups of 5-6 students. The second stage is the implementation stage, students study in groups with student worksheets (LKS). At this stage, students dig up information from the worksheets and then convert the information into mathematical questions (posing mathematical problems). Based on the mathematical problems obtained, students try to find solutions to problems (solving mathematical problems). The tutor guides the discussion and guides students when there are difficulties. The teacher supervises the implementation of the learning process and helps students if the tutor cannot overcome these difficulties. Next is the evaluation stage, at this stage the teacher gives practice questions in other forms so that students can apply concepts or formulas that have been found during learning activities (applying mathematics). Finally, the teacher rives a conclusion from the learning activities

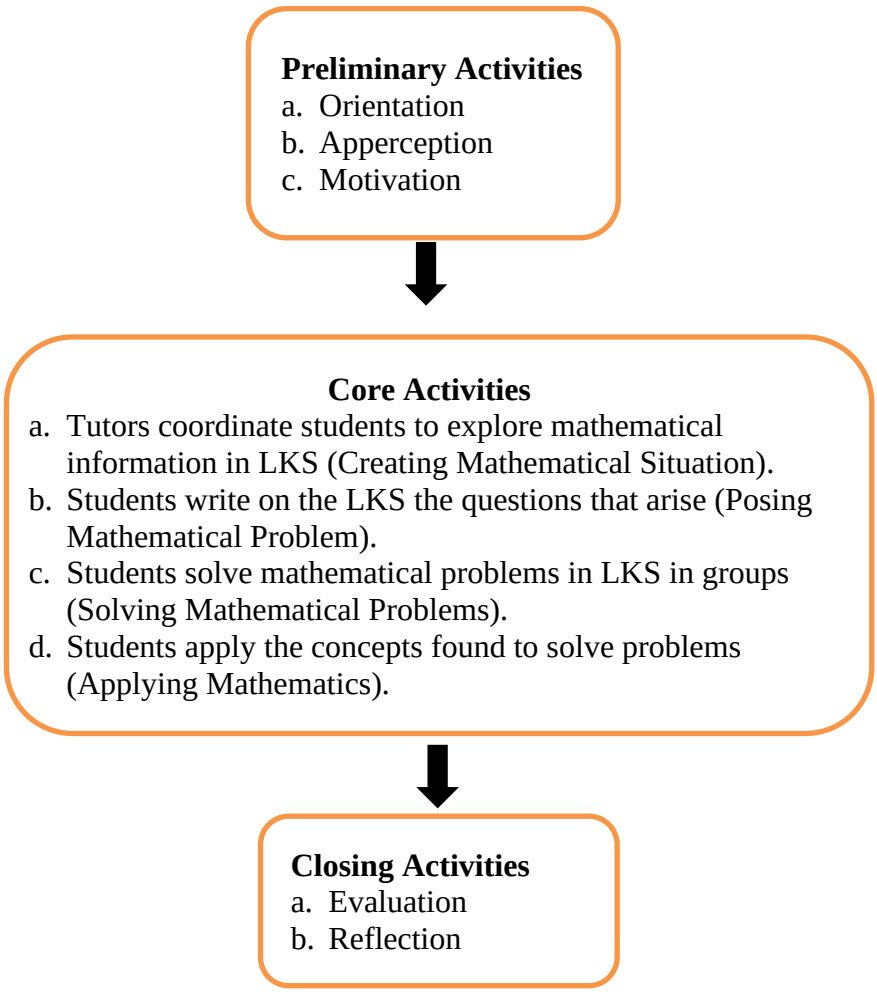

Figure 1. Situation based learning design with peer tutors

The implementation of situation based learning is very well implemented, seen from the observation of the implementation of learning which contains the assessment of the learning process. The learning process is carried out in accordance with the design of the learning model that has been determined. At the preparatory or preliminary stage, the average score is 4.4, which means that the implementation of preliminary activities in the very good category. In core activities the average score is 4.4, which means that the implementation of core activities in the very good category. Likewise with closing activities the average score of 4.5 which means closing activities in the very good category. The assessment on the observation sheet is shown in Table 2.

Table 2. Assessment sheet observation

No	Stages	Observer 1 (Meeting to)			Observer 2 (Meeting to)			Average score
		1	2	3	1	2	3	
1.	Preliminary Activities	4.3	4.2	4.3	5	4.3	4.3	4.4
2.	Core Activities	4.4	4.3	4.4	4.4	4.5	4.6	4.4
3.	Closing Activities	4.2	4.4	4.4	4.6	4.6	4.6	4.5

Student responses were analyzed based on a Likert-scale response questionnaire given to students after the implementation of learning. The response questionnaire contains two aspects, namely students' attitudes towards mathematics lessons and students' attitudes towards learning using a situation based learning model with peer tutors. The aspect of students' attitudes towards mathematics consists of two indicators, namely students' interest in mathematics and the benefits of learning mathematics. Aspects of students' attitudes towards learning using the situation based learning model with peer tutors consist of two indicators, namely interest in learning mathematics using a situation based learning model with peer tutors, and the usefulness of participating in mathematics learning using a situation based learning model with peer tutors. The response questionnaire consists of 20 statements, both positive and negative, which have been validated by experts. Statements are divided into positive and negative statements so that respondents/students are careful in answering and there is no consistency of answers (Malhotra, 2012). Data processing is done with the help of Microsoft Excel. According to Nasution (Susanna, 2017) the results of the questionnaire analysis are grouped using the average score criteria to determine student responses, with the following criteria.

Table 2. Criteria for student response questionnaire results

No	Score	Criteria
1	$3 <$ average score ≤ 4	Very Positive
2	$2 <$ average score ≤ 3	Positive
3	$1 <$ average score ≤ 2	Negative
4	$0 <$ average score ≤ 1	Very Negative

The results of the student response questionnaire can be seen in Table 3 as follows.

Table 3. Student response questionnaire results

No.	Aspect	Indicator	Number of Questions	Average Score	Student Response
1	Students' attitudes towards mathematics	Interest in math lessons	4	2.64	Positive
		Knowing the benefits of learning math	2	3.22	Very Positive
2	Student attitudes towards learning by using a situation based learning model with peer tutors	Interest in learning mathematics using a situation based learning model with peer tutors	6	2.8	Positive
		Shows the benefits of participating in mathematics learning using a situation based learning model with peer tutors	8	2.9	Positive
Amount			**20**	**2.89**	**Positive**

Based on Table 3, it is known that the student response to the situation based learning model as a whole is in the positive criteria with an average value of 2.89. The highest average of 3.22 was obtained on the indicator of knowing the benefits of learning mathematics, while the lowest average of 2.64 was obtained on the indicator of interest in mathematics but still within the positive response criteria.

In the indicator of knowing the benefits of mathematics, the response was very positive with an average score of 3.22. This shows that students agree that mathematics and mathematics lessons are very useful in everyday life. This is in line with the opinion of Puspaningtyas & Ulfa (2020) which states that mathematics is learned because it is useful in everyday life and is useful as a language and tool in the development of science and technology. Learning mathematics will train students to work independently or in groups, be critical, creative, consistent, think logically, systematically, respect opinions, be honest, confident and responsible (Sukarani & Bella, 2022).

Positive responses were also given by students on indicators showing the benefits of participating in mathematics learning using a situation based learning model with peer tutors. Based on the analysis of student answers in the response questionnaire, the average score was 2.9. Likewise with interest in learning mathematics using a situation based learning model with peer tutors, students gave a positive response to the application of the learning model, as seen from the average score on the response questionnaire of 2.8. The interesting thing is that the average value of the student response questionnaire on the indicator of interest in mathematics is the lowest, although it is still in positive criteria, but after being given learning using a situation based learning model with peer tutors their interest in learning and motivation increases. Students who are not interested in learning mathematics consider mathematics to be a difficult subject. In accordance with the opinion of Utami & Cahyono (2020) which states that mathematics is a lesson that is considered difficult by most students.

Positive responses to the application of situation based learning with peer tutors indicate that this learning model can be well received by students. So that this learning model can be said to have advantages over the previously applied learning model. Some of the advantages of the situation based learning model include that students can participate in learning more actively, practice problem posing and problem solving skills, and train students to be able to work together and become peer tutors, because SBL is carried out in groups (Larawati et al., 2016). In addition, the role of peer tutors can make learning activities more relaxed and flexible, because students tend not to be awkward when they have to ask their own friends. This triggers students to try to understand the material more deeply.

▪ CONCLUSION

The implementation of situation based learning with peer tutors was very well carried out and overall received a positive response from students. Students gave positive responses to indicators of interest in mathematics, interest in learning mathematics using a situation based learning model with peer tutors, and the benefits of participating in mathematics learning using a situation based learning model with peer tutors. Students gave a very positive response to the indicators of the benefits of learning mathematics.

▪ REFERENCES

Ahdiyat, M., & Sarjaya, S. (2014). Metode Tutor Sebaya untuk Meningkatkan Hasil Belajar Matematika Pada Materi Pengolahan Data [Peer Tutor Method to Improve Mathematics Learning Outcomes in Data Processing Materials]. Formatif: Jurnal Ilmiah Pendidikan MIPA, 4(1), 71–79.

Alimah, S., & Marianti, A. (2016). Jelajah Alam Sekitar: Pendekatan, Strategi, Model, Dan Metode Pembelajaran Biologi Berkarakter Untuk Konservasi. Semarang: FMIPA UNNES.

Celik, H. C. (2018). The Effects of Activity Based The Effects of Activity Based Learning on Sixth Grade Students' Achievement and Attitudes towards Mathematics Activities. Eurasia Journal of Mathematics, Science and Technology Education, 14(5), 1963–1977.

Chang, B. (2019). Reflection in Learning. Online Learning, 23(1), 95–110.

Hasanah, A. N., Priatna, N., & Yulianti, K. (2021). The Ability Of Mathematical Problem Solving Of Junior High School Students In Situation Based Learning And Discovery Learning. Journal of Physics: Conference Series, 1806(2021), 1-6.

Hasanah, N., & Purwasih, R. (2022). Respon Siswa Terhadap Pembelajaran Matematika Dengan Kemampuan Matematik Habits Of Mind [Student Responses to Mathematics Learning With Mathematical Ability Habits Of Mind]. Jurnal Pembelajaran Matematika Inovatif, 5(1), 149–158.

Hendriana, H. (2014). Membangun Kepercayaan Diri Siswa Melalui Pembelajaran Matematika Humanis [Building Students' Confidence Through Humanistic Mathematics Learning]. Jurnal Pengajaran Matematika Dan Ilmu Pengetahuan Alam, 19(1), 52–60.

Humaidi, Qohar, A., & Rahardjo, S. (2022). Respon Siswa terhadap Penggunaan Video Youtube sebagai Media Pembelajaran Daring Matematika [Student Responses to the Use of Youtube Videos as Mathematics Online Learning Media]. Jurnal Ilmiah Pendidikan Matematika, 10(2), 153–162.

Isrok'atun, & Rosmala, A. (2018). Model-Model Pembelajaran Matematika. Jakarta: Bumi Aksara.

Isrok'atun, & Tiurlina. (2014). Situation-Based Learning Untuk Meningkatan Kemampuan Creative Problem Solving Matematis Siswa SD [Situation-Based Learning to Improve Creative Problem Solving Mathematical Ability of Elementary School Students]. Mimbar Sekolah Dasar, 1(2), 209–216.

Junedi, B., & Susanti, A. (2020). Penerapan Model Pembelajaran Situation-Based Learning Terhadap Pemahaman Matematis Siswa Kelas X SMA [Application of Situation-Based Learning Model to Mathematical Understanding of Class X High School Students]. Jurnal of Didactic Mathematics, 1(1), 47–52.

Larawati, I., Isrok'atun, & Gusrayani, D. (2016). Penerapan Model Pada Materi Sifat Dan Jaring-Jaring Bangun Ruang Sederhana Di Kelas IV SDN Paseh 1 Sumedang [Application of the Model on Material Properties and Simple Space Constructed Networks in Class IV SDN Paseh 1 Sumedang]. Jurnal Pena Ilmiah, 1(1), 71–80.

Lestari, I., Andinny, Y., & Mailizar. (2019). Pengaruh Model Pembelajaran Situation Based Learning dan Kemandirian Belajar Terhadap Kemampuan Pemecahan Masalah Matematis [The Influence of Situation Based Learning and Independent

Learning Models on Mathematical Problem Solving Ability]. Jurnal Nasional Pendidikan Matematika, 3(1), 95–108.

Malhotra, N. K. (2012). Basic Marketing Research : Integration of Social Media. Jakarta: PT Index Kelompok Gramedia.

Puspaningtyas, N. D., & Ulfa, M. (2020). Improving Students Learning Outcomes In Blended Learning Through The Use Of Animated Video. Kalamatika: Jurnal Pendidikan Matematika, 5(2), 133–142.

Rahmawati, N. K., & Kusuma, A. P. (2019). Hubungan Pemahaman Konsep Aritmatika Sosial Dengan Hasil Belajar IPS Materi PPH [The Relationship of Understanding Social Arithmetic Concepts With Social Science Learning Outcomes for PPH Materials]. Buana Matematika: Jurnal Ilmiah Matematika Dan Pendidikan Matematika, 9(1), 1–6.

Sugiyono. (2021). Metode Penelitian Pendidikan (Kuantitatif, Kualitatif, Kombinasi, R&D dan Penelitian Pendidikan. Bandung: Alfabeta.

Sukarani, N. M., & Bella, C. (2022). Sejarah Aritmatika: Manfaat Pembelajaran Sejarah Matematika [History of Arithmetic: Benefits of Learning History of Mathematics]. Jurnal Dunia Ilmu, 2(2), 1–8.

Susanna. (2017). Penerapan Teams Games Tournament (TGT) Melalui Media Kartu Domino Pada Materi Minyak Bumi Siswa Kelas XI MAN 4 Aceh Besar [Implementation of Teams Games Tournament (TGT) through Domino Card Media on Petroleum Materials for Class XI MAN 4 Aceh Besar Students]. Lantanida Journal, 5(2), 93–196.

Ulfa, M., & Saifuddin. (2018). Terampil Memilih Dan Menggunakan Metode Pembelajaran [Skilled in Choosing and Using Learning Methods]. SUHUF, 30(1), 35–56.

Utami, Y. P., & Cahyono, D. A. D. (2020). Study At Home: Analisis Kesulitan Belajar Matematika Pada Proses Pembelajaran Daring [Study At Home: Analysis of Learning Difficulties in Mathematics in the Online Learning Process]. Jurnal Ilmiah Matematika Realistik, 1(1), 20–26.

Utari, G., Kartasasmita, B. G., & Julika, C. (2019). The Application of Situation-Based Learning Strategy to Improve Literacy Skills , Mathematical Problem-Solving Ability and Mathematical Self- Efficacy at Senior High School Students. International Journal of Innovation, Creativity and Change, 6(1), 89–102.

Wali, G. N. K., Winarko, W., & Murniasih, T. R. (2020). Peningkatan Keaktifan Dan Hasil Belajar Siswa Dengan Penerapan Metode Tutor Sebaya [Increasing Student Activity And Learning Outcomes With The Application Of The Peer Tutor Method]. Jurnal Terapan Sains & Teknologi Fakultas, 2(2), 164–173.