aim Journal of Islamic Education Management
Postgraduate Program
Master of Islamic Education Management
State Islamic University of Sunan Gunung Djati

Application of Contextual Learning Model to Improve Students' Problem Solving Ability

Ayi Herwendi
MTS Negeri 2 Bekasi; Indonesia
*Email: abuattaufani@gmail.com

ABSTRACT
This study aims to enhance the problem-solving abilities of Class VIII students at MTS Negeri Bekasi in the subject of Ranked Numbers. Using Classroom Action Research developed by Kemmis & McTaggart, the study followed four stages: planning, acting, observing, and reflecting, conducted over two cycles with each cycle comprising two meetings. The subjects were 35 Class VIII students. Data was collected through observations, tests, and questionnaires, focusing on the learning outcomes and processes using contextual learning models. The findings indicate that the application of contextual learning models significantly improved students' problem-solving skills. Observations revealed that students could analyze and interpret data from frequency distribution tables and histograms and solve related problems effectively. The problem-solving ability test results showed an improvement from cycle I, where the average score was 77.43 with a completeness percentage of 77.14%, to cycle II, where the average score increased to 82.14 with a completeness percentage of 94.29%. Therefore, the implementation of contextual learning models successfully enhanced the problem-solving skills of students in the Ranked Numbers topic

Keywords: *Problem Solving, Contextual Learning, Mathematics, Ranked Numbers*

Introduction

One of the main challenges in learning Mathematics faced by teachers and students, is how teachers can help students to master specific Mathematics materials as well as mastering abilities or competencies that are in accordance with the characteristics of Mathematics learning itself,

Received: 2023-02-07; Accepted: 2024-06-21; Published: 2024-06-21

especially problem solving skills. Each subject in this case has its own characteristics, which are specific and distinguish it from other subjects. Therefore, the purpose of learning Mathematics is not merely to know and or memorize the material learned, but also for example to develop certain abilities that are in accordance with the scientific characteristics of Mathematics itself, especially the ability to solve problems.

This also makes many educational experts state that problem solving ability is an important goal of learning itself (Al-Fathoni, 2023). Problem solving is a strategic competency shown by learners in understanding, choosing approaches and solution strategies, and completing models to solve problems. According to Bayer as cited by Zakaria (2007) states that problem solving ability is closely related to the ability of learners to find answers or solutions to something that is difficult based on the modality of knowledge and experience they have.

This condition means that in learning Mathematics, teachers cannot only teach formulas and numbers, but also need to familiarize students to engage in certain investigations that can arouse students' ability to solve the problems they face. Such abilities show that a complete understanding of the material being studied is mandatory. Because with the ability to solve problems, learners can not only understand theoretically about certain materials from learning Mathematics, such as material about Power Numbers. But students can also apply it in their daily lives.

In the Ranked Numbers material, for example, students are required to master two Basic Competencies, namely: *First,* explain and perform operations on rational numbers and root forms, and their properties; and Second, solve problems related to the properties of operations on whole numbers and root forms. Based on these Basic Competencies, problem solving ability is an important ability expected from students to be able to master the material studied. In the end, students do not just memorize mathematical formulas and certain numbers, but also solve problems related to the presentation of data on the results of rational number operations, root forms, and their properties from the material studied. However, although problem solving skills have become an integral part of achieving the learning objectives of Mathematics, these problem solving skills are not easy for students to master.

In some cases, problem-solving skills can only be achieved if students are familiarized with ways of learning that are directed and can support students' ability to solve problems. Therefore, teachers must be able to choose and apply the right approach, model, strategy, or learning media and support students in developing problem-solving skills by these

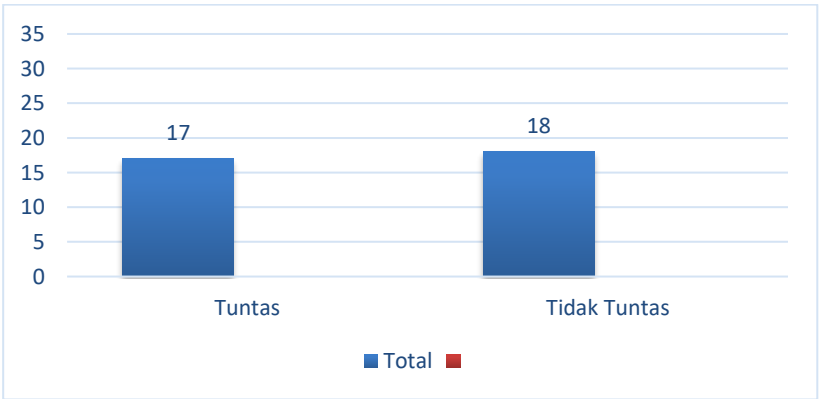
students in the learning process.

This lack of problem-solving ability can be seen from the less than optimal achievement of students related to competencies and indicators of competency achievement in the Ranked Numbers material. Most students, for example, have not been able to solve problems related to the presentation of measurement and enumeration data in frequency distribution tables and histograms, or solve problems related to the presentation of measurement and enumeration data in frequency distribution tables and histograms. This not only shows that learning has not reached the expected target, but also that teachers have not been able to build and foster important abilities from students, especially problem-solving abilities.

The results of the author's initial reflection show that the inability of students to achieve the competency achievement indicators of the previous Power Numbers material is inseparable from the learning procedure that uses presentation and discussion methods. The presentation and discussion method is indeed good for building cooperation and understanding of students in some Mathematics subject matter or other subjects, but this method is not suitable for the needs of improving problem solving skills and mastery of the Power Numbers material studied .

Based on a document review conducted by the author on the learning outcomes of students, it shows that out of 35 students, there are 18 students or 51.43% who have not reached the standard or minimum completeness criteria (KKM) expected from the lesson, and the rest, namely 17 people or 48.57%, have been able to meet or exceed the set KKM. As can be shown in the following figure:

Figure 1. Graph of Students' Problem Solving Ability



The data above shows that most students in Mathematics,

especially the subject of Ranked Numbers, have not achieved an adequate percentage of completeness. This problem is caused by the application of inappropriate learning methods. The indication that the problem solving ability of students is not optimal can be seen from various symptoms as follows; (1) some students have not been able to solve problems related to the presentation of measurement and enumeration data in frequency distribution tables and histograms; (2) some students have not been able to solve problems related to the presentation of measurement and enumeration data in frequency distribution tables and histograms; and (3) students have not been able to fully contribute positively to learning.

As explained, the root of the problem boils down to the use of inappropriate learning models. The use of presentation and discussion models in learning does make students more able to interact with their friends, or develop their cooperation skills in learning, but the presentation and discussion learning methods have not been able to build important abilities from Mathematics learning which are expected in accordance with the indicators of competency achievement of the Ranked Numbers material, namely problem solving skills. This learning makes students unable to develop their ability to solve the problems they face effectively (Windayana, 2016; Tilaar, 2015).

Some of these learning facts show that the situation faced by teachers and students is still a less than ideal learning situation to build students' problem-solving skills. Conditions like this also make teachers finally have to be able to realize what is the source of the problem. Because, again, learning practices are the responsibility of the teacher himself. If there are students who are unable to achieve the expected conditions of the learning that takes place, then it means that the teacher has not brought learning in a direction that is in accordance with the needs, interests and talents of the students concerned (Yakub et al., 2019; Asri, 2022; Arini & Agustika, 2021).

In the mastery of Power Numbers material in particular, the demand to build and improve problem solving skills in students, ultimately becomes a demand on teachers to be able to choose and use the right learning model. In other words, teachers must realize the importance of using learning models that are in accordance with the material taught and the objectives to be achieved. In this case, teachers need to choose and use learning models that can attract students' interest through learning activities that place students as the main problem solvers in learning. The learning model that is considered to support the growth of problem solving skills in learning is the contextual learning model (Firmansyah et

al., 2021; Sa'dijah, 2013; Brinus et al., 2019).

Thus, the author's effort to overcome this is to implement learning that is more able to encourage and stimulate students to be active, namely the contextual learning model. The contextual learning model itself is a form of learning model that emphasizes the process and full involvement of students to be able to find the material learned and connect the subject matter with real life situations, where students are ultimately encouraged to be able to apply or apply their knowledge in real life so that they can take the meaning and benefits of that knowledge (Sanjaya, 2010).

Learning that uses a contextual model is learning that uses a variety of contextual problems as a starting point, so that students learn by using their knowledge and abilities to solve problems, both real problems and simulated problems, both problems related to other lessons at school, school situations, and problems outside school, including relevant workplace problems (Suryanto, 2002). It is ultimately a holistic educational process and aims to help students to see the meaning of the subject matter they learn by relating the material to the context of their daily lives (personal, social and cultural contexts), so that students have knowledge/skills that can be flexibly applied from one problem/context to another (Rudiyanto, 2009).

The contextual learning model, in other words, not only has the right characteristics to overcome the low mastery of students in learning Mathematics on the subject of Power Numbers, but also has compatibility with the characteristics and objectives of Mathematics learning to then foster the expected ability of Mathematics learning, namely problem solving ability. Thus, if the problem faced by the teacher-writer, in this case, is how to foster good problem-solving skills in students on the subject of Power Numbers, then the use of this contextual learning model can be the answer to this.

Some previous research has also shown that the use of contextual learning models has a positive influence on teachers' efforts to improve student learning outcomes, learning motivation, understanding ability, or other abilities of students. This effect is found not only in learning Mathematics, but also various other subjects. A study conducted by Rahmadani et al. (2023), shows that the contextual learning approach prioritizes real and concrete learning behavior, this is based on the developmental phase of children and their daily life with the surrounding natural environment. The implementation of the contextual approach in mathematics learning is seen as strategic for improving the professional quality of teachers in improving students' critical thinking through

contextual basic knowledge owned by students from their daily lives with the surrounding environment.

Another study from Miryani et al. (2020) showed an increase in each cycle related to the application of the contextual learning model by the teacher in the learning that took place. Increased learning achievement was seen in each cycle. In cycle I obtained an average of 110.87 with 55% learning completeness and cycle II obtained an average of 164.18 with 82% completeness. The increase from cycle I to cycle II was 27%. The results of this study indicate that learning mathematics using contextual learning can improve the attitude of responsibility and mathematics learning achievement. The same results from the research of Masrura et al. (2022) revealed that overall the research conducted had an effect and was effective on students' mathematics learning with an effect size of 0.25 or in the category of moderate effects that approached large. The contextual approach also provides influence and effectiveness based on the level of education (both junior and senior high school), the dependent variable (on learning outcomes, problem solving ability, mathematical connection ability, mathematical critical thinking ability and student confidence) and in terms of subject matter (on geometry, trigonometry, and SPLDV). With the results of the analysis obtained, it shows that the Contextual Approach is effectively used in mathematics learning.

Another consideration is that the selection and implementation plan of this contextual learning model must be implemented immediately, considering that if the problem of low problem solving ability is not addressed immediately, this condition can result in low student learning completeness, poor learning outcomes, and unachieved Mathematics learning competencies. In turn, learning cannot achieve the set goals. Based on these considerations, the use of contextual learning model is the action chosen to be applied in this study. This study aims to examine how the impact of the application of contextual learning model to improve the problem solving ability of students in class VIII MTS Negeri Bekasi.

Methods

The design of this class action research, with reference to the Hopkins model (2011) researchers used the Kemmis & McTaggart model research design where there are four stages in each cycle including action planning (*planning)*, implementation of action (*acting*), observation of action (*observing),* and reflection on action (*reflecting)*. The research was conducted in 2 cycles. If the evaluation results in cycle I still show that

there are problems that have not been resolved or new problems arise, then the researcher will make improvements in cycle II with the same pattern. In other words, the results of the reflection in cycle I were carried out to determine the steps for improvement in cycle II.

The first analysis technique used was descriptive statistical analysis technique. This technique is used to analyze simple quantitative data. While the second data analysis technique is interactive analysis technique (Miles & Huberman, 2014). This analysis technique is used to analyze quantitative data, in the form of words about the learning process that is being and has taken place.

Results and Discussion

This research was conducted in Class VIII of MTS Negeri Bekasi. The total number of students was 35 people. More specifically, this research was conducted in the Mathematics subject of Ranked Numbers in the odd semester of the 2019/2020 academic year.

It can be conveyed that the description of the condition of the class results and changes that occur during and after the implementation of actions using contextual learning models, *the* teacher has carried out all action procedures well. This can be seen from the observation scale value of 72.82 in cycle I of the research, with several observations including: (a) Teachers are still unclear in explaining the procedures that must be carried out by students related to the *learning* model being carried out; (b) Teachers are still lacking in helping students to carry out exploration, inquiry, and generalization; and (3) Teachers are still not optimal in addressing group learning (*learning community*) and working together to solve problems. This was then improved in cycle II of the research.

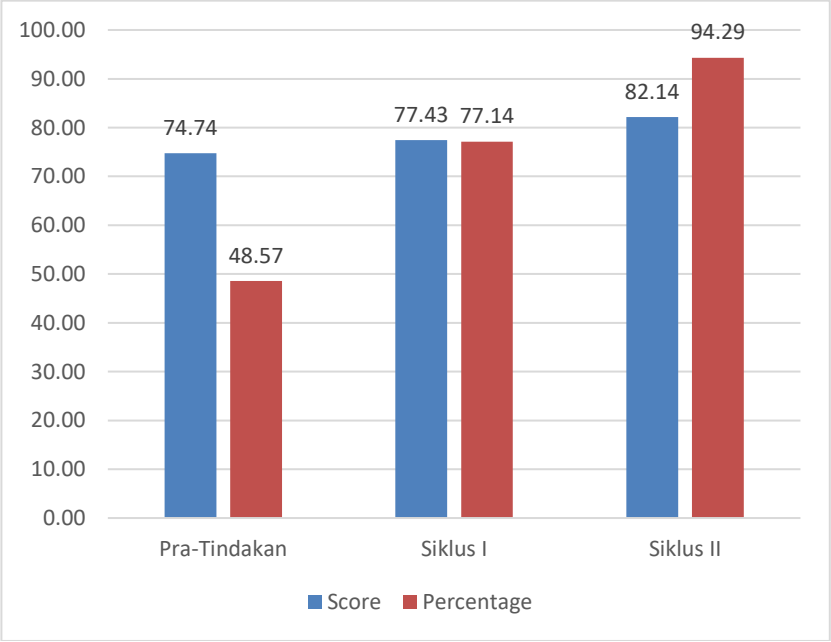
In cycle II, teachers improved the implementation of action procedures, especially in the initial activities in explaining the learning steps using contextual learning strategies to students in more detail. This effort was then continued also with the third step of the teacher's action which could better direct students in conducting exploration, inquiry, and generalization. Teachers are also better able to refine their actions in the fourth step which helps learners in group learning to work together effectively for problem solving. This in turn makes the level of teacher action implementation increase to 84.73%. The level of activeness and participation of the learners themselves was quite good. This can be seen from how their learning activities are in accordance with the procedures of the contextual learning model itself.

The role of contextual learning model has been very helpful for

teachers in improving the problem solving ability of students on the material of Ranked Numbers, which is characterized by several aspects that become indicators of success. The results of observations on the learning process using contextual learning models show that students are better able to solve problems related to the properties of whole number operations and root forms. Based on the results of the test of students' problem solving skills that have been carried out, in cycle I it is found that the average score achieved is 77.43 with a percentage of completeness of 77.14%. Furthermore, in cycle II the average score obtained was 82.14 with a percentage of completeness of 94.29%. Thus, the application of contextual learning models is able to improve the problem solving ability of students on the Ranked Numbers material that has been carried out.

The results of the implementation of the actions in the two cycles of this study can be illustrated in the following graph:

Figure 2: Comparison of Action Results between Cycles



Furthermore, students' responses to this contextual learning model are very positive as shown in the results of the questionnaire conducted by the teacher to students. In general, students are quite interested in this contextual learning model, because it makes students more actively

involved in learning, able to understand the application of formulas and measurement results in the right context, and contextual learning models make students more able to develop their problem solving skills independently.

These results are in line with the theory of contextual learning models that emphasize the involvement of students in learning to find material or the learning process is oriented to the direct experience process. The learning process using this contextual learning model does not only expect students to be able to receive lessons, but also to be actively involved in searching and finding the material taught themselves, as well as solving their own problems (Sannjaya, 2010).

This study also shows the same conclusion as some previous research related to the use of contextual learning models that can help teachers in improving certain abilities of students, understanding, motivation, or learning outcomes of students themselves (Indriani, 2017; Yolanda & Wahyuni, 2020; Prastitasari, 2019; Octavyanti & Wulandari, 2021; Rahmah, 2021; Miryani et al., 2020).

Conclusion

This study shows that the application of contextual learning model can be done in various subjects, especially Mathematics subject, and specifically the Power Numbers material, as long as the teacher can adjust the steps of its application to the context of the problem at hand and the needs of the learners themselves. The role of contextual learning model on students' problem-solving ability showed positive results, especially in learning Mathematics of Power *Numbersx. The* use of this contextual learning model is able to improve the problem solving ability of students in Class VIII MTS Negeri Bekasi, on the material studied.

This is reflected in the increased ability of students to solve problems related to the properties of whole number operations and root forms. Based on the results of the test of students' problem solving skills, in cycle I the average score achieved was 77.43 with a percentage of completeness of 77.14%. Furthermore, in cycle II the average score obtained was 82.14 with a percentage of completeness of 94.29%. Thus, the application of contextual learning models is able to improve the problem solving ability of students on the Ranked Numbers material that has been carried out.

References

Al-Fathoni, B. Z. (2023). Enhancing Teacher Competence In Implementing The Independent Learning Curriculum: The Role Of Change Management. *AIM: Journal of Islamic Education Management,* 1(1), 38-55.

Arini, N. L. P. D., & Agustika, G. N. S. (2021). Mathematics Learning Application Based on Contextual Approach to Flat Buildings Material. *Journal of Educational Research and Development,* 5(1), 50-59.

Asri, M. (2022). Effectiveness of Contextual Approach Implementation in Mathematics Learning for Class XI Students of SMA Negeri 2 Makassar. *Scientific,* 8(2), 103-107. https://doi.org/10.31605/saintifik.v8i2.373

Brinus, K. S. W., Makur, A. P., & Nendi, F. (2019). The Effect of Contextual Learning Model on Junior High School Students' Mathematics Concept Understanding. *Mosharafa: Journal of Mathematics Education,* 8(2), 261-272. https://doi.org/10.31980/mosharafa.v8i2.439

Firmansyah, E., Sari, N. M., & Mubarika, M. P. (2021). Communicative Module for Mathematics Learning with Contextual Approach. *Prisma,* 10(2), 264. https://doi.org/10.35194/jp.v10i2.1824

Hopkins, David. (2011). *Teacher's Guide to Classroom Action Research*. Yogyakarta: Student Center

Indriani, A. (2017). Design of Contextual Approach to Learning Mathematical Statistics. *Axiom,* 8(1), 98. https://doi.org/10.26877/aks.v8i1.1504

Masrura, S. I., Amaliyah AR, R., & Muliana, A. (2022). Meta Analysis of the Use of Contextual Approach in Mathematics Learning. *J-HEST Journal of Health Education Economics Science and Technology,* 3(2), 69-80. https://doi.org/10.36339/jhest.v3i2.52

Miles, M.B, Huberman, A.M, & Saldana, J. (2014). *Qualitative Data Analysis, a Methods* Sourcebook. 3rd Edition. USA: Sage Publications.

Miryani, A. R., Muslim, A., & Pamujo, P. (2020). Improving Mathematics Learning Achievement through Contextual Learning in Elementary School. *Mukadimah: Journal of Education, History, and Social Sciences,* 4(1), 22-25. https://doi.org/10.30743/mkd.v4i1.1522

Octavyanti, N. P. L., & Wulandari, I. G. A. A. (2021). Development of Learning Videos Based on Contextual Approach in Mathematics

Subjects for Grade IV Elementary School. *Edutech Undiksha Journal,* 9(1). https://doi.org/10.23887/jeu.v9i1.32223