

THE IMPLEMENTATION OF THE CONTEXTUAL TEACHING AND LEARNING (CTL) MODEL ON ALGEBRA LEARNING, IS IT EFFECTIVE?

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ABSTRACT

This research aims to find out the influence of the application of the Contextual Teaching and Learning (CTL) approach on the quality of mathematics learning in algebraic materials. Mathematics is often considered difficult by students, so an approach is needed that can increase student understanding and motivation. The CTL approach connects the material with real-life situations, which can make learning more meaningful and relevant for students. In the previous research they used several methods including experimental design with pretest-posttest control group design. In the experimental group they were taught using the CTL approach, while the control group used conventional learning methods. The instruments used include pretest and posttest tests, observations, and questionnaires to measure student involvement and perception. The results of the study show that the application of CTL can increase the understanding and involvement of students in learning algebraic materials, as well as improve their mathematical reasoning skills. Therefore, the CTL approach is proven to be effective in improving the quality of mathematics learning in high school students.

Keywords: *Contextual teaching learning (CTL), algebra, mathematics.*

INTRODUCTION

Mathematics is one of the subjects taught in school. In studying mathematics there are objectives as stated in Minister of National Education Regulation Number 22 of 2006 which states that one of the objectives of studying mathematics is to have the ability to communicate ideas with symbols, tables or diagrams to study situations or problems. One of the characteristics of mathematics is that it has abstract objects. This abstract nature is what causes many students to experience difficulties in learning mathematics (Angriani, 2013).

Kartika (2018) explains that mathematics is a field that aims to improve the ability to calculate, measure and use formulas that can be used practically. However, because mathematics is one of the subjects that students consider difficult, mathematics is often a subject that most junior high school students are less interested in. Thus, a learning approach that prioritizes teachers as the main source of information is the main choice. One of the weaknesses of the lecture method, according to Lufri (2020), is that it becomes boring for students if it takes too long, making students passive.

Algebra is one of the mathematics subject materials that students receive at school. Everyone who has studied has certainly used algebraic concepts in everyday problems. In algebra learning, understanding concepts is very important, by understanding concepts learning will be more meaningful for students. Students not only memorize and use formulas, but can also understand the concepts of the material being studied by Marsita et al. (Oktaviani & Haerudin, 2021). From the problems that have been described, researchers want to conduct research to find out how much students' mathematical understanding ability in algebra material is.

In this case, the contextual learning model (CTL) is a learning process that provides maximum involvement for students in the process of achieving learning content and its relationships through real world contexts, as stated by

Afriani (2018). This strategy encourages students to link the abilities they know with daily practice. As a result, it is hoped that learning will be more significant for students who naturally do not need to transfer information from teacher to student; rather, it can be done with the aim of increasing student activity. Students must have a strong understanding of what learning is, what its benefits are, its position, and how to achieve it. Therefore, they put themselves in their own position, which can be used as preparation for later life, with the guidance and direction of the teacher.

In contextual programs, the teacher's responsibility is to encourage students to obtain real results. In other words, teachers deal with strategy more than just providing information to students. Teaching and learning strategies, according to Simatupang (2019), are plans written by teachers to achieve curriculum objectives through learning tools. Teachers must make the class a cohesive unit to teach students innovation. It should be the teacher's task in the classroom modified with a contextual view.

METHODS

This research uses a literature review approach, namely all reading materials that may have been read and analyzed, both published and in personal collections. Literature studies are often linked to a framework or theoretical basis, namely the theories used to analyze objects. The source collection method in this paper uses literature reviews in journals and scientific articles published online and research related to key references, state of art, and the latest research (novelty). The data analysis technique uses data reduction in the form of taking theories that are considered important from a journal and article related to the theme of this paper, then presenting the data and drawing conclusions from the data that has been collected and is considered relevant to the theme of this paper.

RESULTS AND DISCUSSION

Some of the results of research that has been carried out previously by several researchers include the following:

1. Research conducted by Anggun Anggraini in 2023 under the research title "Application of the Contextual Learning Model to the Mathematics Learning Outcomes of Class IV Students at Sd Negeri 1 Karang Anyar" research which was developed through a Quasi Experimental model of Pretest Posttest Control Group Design design. Based on the results of research data analysis, it was found that the contextual learning model had an influence on the mathematics learning outcomes of class IV students at SD Negeri 1 Karang Anyar. This can be proven by the results of hypothesis testing that $\text{sig} (0.01) < 0.05$ and $t\text{-count} (2.74) > t\text{-table} (2.03)$ so that the research hypothesis is accepted, with the N-Gain value of the experimental class amounting to 0.7594 or 75% (effective category) and the N-Gain obtained by the control class was 0.5459 or 54% (less effective category).
2. Research conducted by Mukhni, Armiati and Hastuti Febrianti in 2013 with the research title "Effectiveness of Applying a Contextual Approach in Improving the Mathematical Problem Solving Ability of Class VIII Students at SMPN 9 Padang" research which was developed through a Quasi Experimental model of Pretest Posttest Control Group Design design. The population of this research was class VIII students at SMPN 9 Padang in the 2012-2013 academic year. The sample for this research was students from class VIII5 as the experimental class and class VIII6 as the control class, who were chosen randomly. The instrument of this research is a test (pretest and posttest). The research results show that the application of a contextual approach in mathematics learning is quite effective in improving students' mathematical problem solving abilities, when compared to direct learning.

3. Research conducted by Astipina in 2019 with the research title "Development of an Illustrated Bilingual Module Based on the Contextual Teaching and Learning (Ctl) Approach on the Main Material of Middle School Algebra Class V." This research and development uses the 4D development model, which consists of four stages, namely definition stage, design stage, development stage and disseminate stage. The results of the development of the bilingual module in terms of complete material with a contextual teaching and learning (CTL) approach, in terms of module design there is a glossary, concept map, summary, and in terms of language it uses two languages (bilingual). The module development was said to be valid by all material experts with an average assessment score of 3.33. with the criteria "valid". The results from media experts obtained an average score of 3.33 with "valid" criteria, and the results from linguists obtained an average of 3.87 with "valid" criteria, so the average score from the entire expert team was 3.54 and declared very worthy. The results of small group trials obtained an average score of 3.41 with the criteria "very interesting", and large group trials obtained an average score of 3.36 with the criteria "very interesting", so that an average attractiveness score of 3 was obtained. 38 so the module is declared very interesting. The effectiveness test results were obtained from the N-gain test with an average score of 0.77 with "high" criteria in the range $(g) > 0.7$.

Based on the results of research data analysis, it can be concluded that the development of the bilingual module is in terms of material in terms of design and in terms of language. The feasibility of the expert team obtained an average score of 3.54 with very feasible criteria. Student responses from the attractiveness test obtained an average score of 3.38 which was very interesting, and the N-gain effectiveness test obtained an average of 0.77 in the high category.

4. Research conducted by Laswadi in 2023 with the research title "Improving Students' Algebraic Thinking Ability Using the Contextual Teaching and Learning (Ctl) Approach". This research used two sample classes, namely, the experimental class and the control class. research developed through a Quasi Experimental model, Pretest Posttest Control Group Design. This research tries to apply the Contextual Teaching and Learning (CTL) approach to improve students' algebraic thinking abilities. The aim of this research is to find out whether the CTL approach can improve students' algebraic thinking abilities. The population in this study were 77 class VIII students at MTsN 6 Kerinci, Jambi Province. The research sample consisted of 38 students who were divided into two groups. The method used in this research is an experimental research method. The research results showed that the N – Gain in the experimental group was at medium criteria, namely 0.55 and the control group was at low criteria, namely 0.26. Based on the results of hypothesis testing, the CTL approach significantly improves students' algebraic thinking abilities. Thus, the CTL approach needs to be implemented in current learning to support improving students' algebraic thinking abilities.
5. Research conducted by Harwan, Sulistyo Jeni Antowo, Idha Novianti in 2023 under the research title "Effectiveness of Student Learning Through a Contextual Teaching and Learning Approach to Algebra Material". This study was carried out in two cycles, with one meeting per cycle. This research uses test tools to find out how effective student learning is. The results of the research showed that the overall average value of student learning achievement indicators in cycle I was 69.23% and rose to 92.30% in cycle II. The average value of student learning outcomes in cycle I was 69.23% and increased to 85.00% in cycle II, resulting in classical completion. According to this research, contextual teaching and learning

approaches can help Class VII middle school students learn about algebra material.

CONCLUSION

From the discussion that has been described, it can be concluded that the Contextual Teaching and Learning (CTL) approach has proven to be effective in improving students' mathematical understanding, especially in algebra material. Various studies conducted show that the application of contextual learning models can improve students' mathematics learning outcomes, both in the aspects of problem solving, algebraic thinking, as well as in terms of student motivation and involvement in the learning process.

In the context of algebra learning, CTL helps students relate mathematical concepts to real life situations, so that learning becomes more meaningful and relevant. Apart from that, this approach also reduces the passive nature of learning, because it encourages students to actively participate and think critically.

Overall, the research that has been discussed shows that the use of the CTL approach is able to have a significant positive impact on improving student learning outcomes, both in terms of mathematical knowledge, problem solving skills, and algebraic thinking abilities. Therefore, it is highly recommended to apply the CTL approach in mathematics learning, especially in algebra material, to support the development of a deeper and more applicable understanding for students.

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Hopefully this paper can provide positive benefits and contributions, both for the development of mathematics learning and for readers who are interested in this topic. The author realizes that there are still many shortcomings in this paper, therefore we really hope for constructive criticism and suggestions for future improvements.

REFERENCES

- Anggraini, A. (2023). Application of the Contextual Learning Model to the Mathematics Learning Outcomes of Class IV B Students at SD Negeri 1 Karang Anyar (Doctoral dissertation, IAIN Metro).
- Antowo, S. J., & Novianti, I. (2023). Effectiveness of Student Learning Through a Contextual Teaching and Learning Approach on Algebra Material. *Proceedings of the National Teachers' Scientific Meeting*, 15(1), 309-319.
- Astipina, A. (2019). Development of an Illustrated Bilingual Module Based on the Contextual Teaching and Learning (CTL) Approach on the Main Material of Middle School Algebra for Class VII (Doctoral dissertation, UIN Raden Intan Lampung).
- Aufa, N. (2024). Mathematical Understanding and Student Interest in Algebra Operations Material with the Contextual Teaching and Learning (CTL) Learning Model Assisted by Algebra Tiles. *CENDEKIA: Journal of Scientific Research and Assessment*, 1(3), 115-121.
- Febrianti, H. (2013). Effectiveness of Applying a Contextual Approach in Improving the Mathematical Problem Solving Abilities of Class VIII Students at SMPN 9 Padang. *Prosiding SEMIRATA 2013*, 1(1).
- Kurniati, D., & Jailani, M. S. (2023). Literature Review: Key References, State of Art, Recent Research (Novelty). *QOSIM: Journal of Education, Social & Humanities*, 1(1), 1-6.

- Laswadi, L. (2023). Increasing Students' Algebraic Thinking Ability through the Contextual Teaching and Learning (CTL) Approach. Proximal: *Journal of Mathematics Research and Mathematics Education*, 6(2), 24-33.
- Ratnasari, S. F., & Saefudin, A. A. (2018). The effectiveness of the contextual teaching and Learning (CTL) approach is seen from students' mathematical communication abilities. MaPan: *Journal of Mathematics and Learning*, 6(1), 119-127.

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3	Pendahuluan	<ul style="list-style-type: none"> • Paragraf pertama menjelaskan konsep dasar penelitian • Fenomena penelitian • Gap peneliti • Kebaruan • tujuan mengangkat judul ini • Minimal citasi/referensi 5 	Sesuai
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