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The effectiveness of contextual approach on students' comprehension ability

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Abstract

This study aimed to determine the effectiveness of the contextual approach in improving students' algebraic arithmetic operations. This research is a Classroom Action Research (CAR) conducted in two cycles with each cycle consisting of two meetings. Data collecting techniques conducted in each cycle were tests and observation. The data analysis was performed on students' learning outcomes and the results of observations. Based on the analysis performed in the first cycle, students had poor learning outcomes in algebraic arithmetic operations. After improvements were made in the second cycle, there was an increase in the students' test results. Furthermore, the observations obtained a percentage increase in student activity between the first cycle and the second cycle. This study shows that the contextual approach is quite effective in improving the understanding of the seventh-grade students in algebraic arithmetic operations.

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INTRODUCTION

Students need to master the studied concepts well in learning mathematics (Sugandi & Bernard, 2018). Mathematics is an important instrument to solve a problem in everyday life (Sumadiasa, 2014; Syamsuddin & Istiyono, 2018). It can initiate a concept to think logically and systematically (Rattanatumma, 2016). Learning mathematics is a continuous process to acquire new concepts, ideas, and knowledge using previous experience (Taleb et al., 2015). However, problems are often found that most students complain about and have difficulty understanding mathematical equations (Masruroh et al., 2020). The problems occur because mathematics is a scientific field related to numbers that make students turn away from learning.

The learning process will be more meaningful if students get direct experience of what they are learning (Purnawati dkk., 2019). Material-oriented learning has proven to be successful if it is applied in a short time. However, if it is applied over a long period, students will face difficulties when solving a problem (Aqib, 2013). The level of student activity in a lesson is a benchmark for the quality of the learning (Rustam & Adli, 2016).

Mathematical concept delivery is never separated from the role of a teacher. Teachers have an active role in the learning process and play an essential role in an effective learning process (Saragih & Surya, 2017; Yunus et al., 2019). Teachers need to prepare learning that can involve students' reasoning abilities in solving problems in everyday life (Amir, 2014). Teachers' pedagogical competence and social competence must be reliable to determine the appropriate learning model for the studied material so that the learning effectiveness can be achieved (Brew, 2011).

The contextual learning model is learning that emphasizes understanding by linking the subject matter to the real-life context (Khotimah & Masduki, 2016) and students' experiences so that the students can easily understand the material. The researchers were concerned about the students' poor understanding of learning mathematics. Learning using conventional methods at SMP Negeri 5 Sungailiat so far shows that students' participation is still lacking. As a result, students' understanding has not improved.

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In studying algebraic arithmetic operations, students often encounter terms that they have never seen in their daily lives in society, such as the variables, coefficients, and constants. Therefore, an approach is needed that can help students understand the arithmetic operations through everyday life associations. Previously done research discovered that the contextual approach has been held face-to-face within very sufficient time. However, the COVID-19 pandemic reduces the learning duration. The lack of time allotment creates challenges for teachers in providing material. The relevant approach to the problems is the contextual approach. Therefore, this study aimed to determine the effectiveness of the contextual approach on the seventh-grade junior high school students' understanding of algebraic arithmetic operations.

METHOD

The method of this study is Classroom Action Research (CAR) conducted in two cycles. Each cycle consisted of two meetings. The data collecting techniques used were tests and observation. Observational data were taken together with the action process, while the learning outcomes test was performed at the end of the second meeting in each cycle. The pattern of the study can be seen in Figure 1.

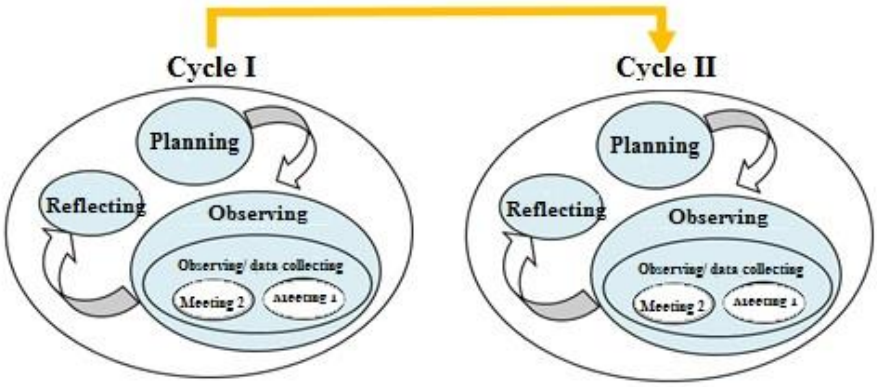

Figure 1. Research Pattern

The mathematics' Criteria of Minimum Competency (KKM) for seventh-grade students is 70. The description questions were used in the final test which consisted of five questions. The questions had been validated using the Product Moment formula. The observation technique was done by observing teacher activities and student activities. The observations were performed by an observer, namely a peer teacher who was assisted by a questionnaire. The obtained data were analyzed using a quantitative-descriptive approach. The data analyses performed were the analysis of students' learning outcomes and the analysis of the results of observations. The subjects of this study were the seventh-grade students of SMP Negeri 5 Sungailiat which consisted of 33 students. This research was conducted in the first semester of the 2020/2021 academic year.

RESULTS and DISCUSSION

The study was conducted at SMP Negeri 5 Sungailiat in November 2020. It consisted of two cycles, namely cycle I and cycle II. Each cycle consisted of two meetings.

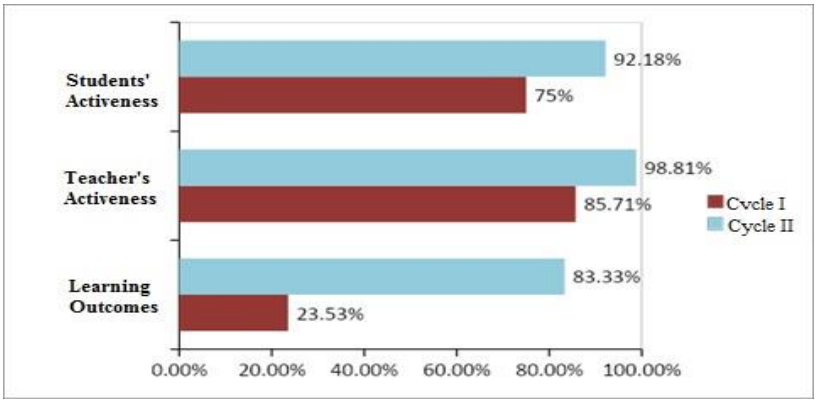

Figure 2. The Results of Cycle I and Cycle II

Figure 2 shows that the observation on teacher's activeness in the first cycle obtained a percentage of 85.71% and the students' activeness percentage was 75%. Furthermore, based on the students' learning outcomes collected through the test on 17 students, only four students achieved the KKM standard and 13 other students did not achieve the KKM standard. Therefore, students' completeness percentage was 23.53% with an average value of 56.47.

In the second cycle, the observation on teacher's activeness obtained a percentage of 98.81% and the students' activeness percentage was 92.18%. Furthermore, based on the students' learning outcomes collected through the test on 18 students, 15 students achieved the KKM standard and 3 other students did not achieve the KKM standard. Therefore, students' completeness percentage was 83.33% with an average value of 87.35.

DISCUSSION

The contextual approach applied in algebraic arithmetic operations material affected the learning process which leads to students' understanding. It can be seen from the percentage improvement of teacher and students' activeness and students' learning outcomes between cycle I and cycle II.

In cycle I, the learning process was performed face-to-face with a reduction in learning hours due to the COVID-19 pandemic. The researchers can only provide material with limited learning time so that the introduction of algebraic arithmetic operations was not fully understood. As a result, the students had difficulty distinguishing variables, coefficients, and constants. When the researchers did apperception by asking the students' opinions about algebraic arithmetic operations, some students had not shown their activeness in expressing their opinions. Some students expressed their opinions, but the researchers had not given awards to students who were active in class. Thus, some things need to be improved, namely time management that must be maximized, a contextual approach that needs to be emphasized, and the need to provide learning motivation in the form of appreciation for student activity in class.

In cycle II, improvements were made based on the learning process in cycle I. the researchers can manage time better because the materials had been given in cycle I. The contextual approach was emphasized to distinguish variables, coefficients, and constants. An example of the application of the contextual approach can be seen in Figure 3.

Figure 3. The Application of the Contextual Approach

In Figure 3, the material for algebraic arithmetic operations is associated with objects that are often encountered in everyday life. The researchers explained that the variable x is represented as a bicycle, the variable y is represented as a vegetable, and the variable z is represented as a pencil. Each variable has different characteristics so that the three variables cannot be added together. In the coefficient, the researcher explained that the coefficient is the number of variables x, variable y, and

variable z such as 3x means that there are 3 bicycles, 5y means there are 5 vegetables, and 5z means that there are 5 pencils. The process of algebraic arithmetic operations can be performed if variables are the same. On constants, the researchers explained that constants are only numbers that do not contain any variables. The learning process in cycle I and cycle II can be seen in Figure 4 and Figure 5.

Figure 4. Learning in Cycle I

Figure 5. Learning in Cycle II

The contextual approach affected students' understanding in distinguishing variables, coefficients, and constants so that students could complete the test well. Increased understanding of algebraic arithmetic operations from cycle I to cycle II can be seen in students' learning outcomes. Besides, the researchers awarded and praised the active students. Students' activeness in learning can be seen in Figure 6.

Figure 6. Students' Activeness in Learning

There was an increase in students' understanding between the first and the second cycle. The result is similar to the research conducted by Saragih & Surya (2017) that learning mathematics using a contextual approach can increase students' effectiveness from the first meeting (79.5%), the second meeting (85.75%), and the third meeting (86.75%). This approach is effectively applied at SMK Harapan Mekar 2 Medan when viewed from students' learning mastery, students' learning activities, and teachers' learning management. Furthermore, research conducted by Sunaryo & Fatimah (2019) shows that there is an effect of a contextual approach with scaffolding learning model in increasing mathematical critical thinking skills (Kurniati et al., 2015) The teacher explains the learning material by linking it to the real world. This linkage plays a role in developing students' various mathematical abilities (Yoon et al., 2018). Also, the contextual approach can increase students' interest in learning which leads to better learning outcomes (Simega, 2014). Active participation allows the student to connect and apply the knowledge they learn with the real-life experiences they have gained (Sulianto, 2011). This approach also improves students' communication skills, learning activities, and the ability to express opinions (Jl & Parman, 2013).

CONCLUSION

Based on the results of research and discussion, it can be concluded that the contextual approach was effective and could increase the understanding of the seventh-grade students in learning algebraic arithmetic operations. Most students can achieve mastery learning through the contextual approach in cycle I and cycle II. Students' learning outcomes improved in the second cycle. It is suggested for further researchers to integrate the contextual approach with technology so that it can be relevant to the current pandemic situation.

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