APPLICATION OF LEARNING CYCLE 5E (LC5E) LEARNING MODEL TO IMPROVE MATHEMATICS LEARNING OUTCOMES FOR CLASS X SMK RIAU TAXATION

Sri Rizka Putr[1*)], Alzaber[2]

1,2Universitas Islam Riau
[1*)] sririzkaputri@student.uir.ac.id
[2)] alzaber@edu.uir.ac.id

Abstract. This study aims to improve the learning process and improve mathematics learning outcomes for the Riau Taxation Vocational School students through Learning Cycle 5E (LC5E). This research is classroom action research which consists of 2 cycles. The subjects in this study were students SMK Riau Taxation, totaling 24 people, with 21 female students and three male students. Data collection instruments in observation sheets and learning outcomes tests were collected using observation and test techniques. The data analysis was carried out by analyzing qualitative data for observation sheets and quantitative data for learning outcomes tests. The results showed an increase in student learning outcomes. The number of students who achieved the KKM increased in UH 1 and UH 2 from the basic score. The percentage of completeness on the basic score is 45% (11 students) at UH I, is 62.50% (15 students), and at UH 2, 70.83% (17 students). From the results of the research above, it can be concluded that the application of Learning Cycle 5E (LC5E) can improve the learning process and improve student learning outcomes in Mathematics at the Riau Taxation Vocational School, especially in arithmetic sequences and series material.
Keywords: Learning Cycle 5E (LC5E), Math Learning Results

1. INTRODUCTION

Education is a conscious effort that is intentionally designed to achieve the goal, namely improving the quality of human resources and is one way of forming human abilities to deal with problems that arise in an effort to create a good future.

Mathematics is one of the basic sciences that has an important role in education, because learning mathematics is a tool used to help students think scientifically [1]. Mathematics has a role not only in the field of science and technology, but also plays a role in everyday life by equipping students with logical thinking skills/competencies to be able to solve a problem related to real life [2].

One indicator of student success in mastering mathematics is seen from learning outcomes. Improved learning outcomes are expected, in order to obtain mastery of student learning [3]. Students are said to be complete if the score of students' mathematics learning outcomes reaches the predetermined Maximum Completeness Criteria (KKM) [4]. Each school has a different Maximum Completeness Criteria (KKM), which is adapted to the circumstances of the school.

Based on the results of the researcher's interview with the teacher of class X Mathematics at the Riau Tax Vocational School on Friday, January 20, 2021, information was obtained that in the learning process the mastery of students' mathematics material was not as expected. This is evidenced by the achievement of the daily test KKM, where students achieve the KKM only 45% of the 24 students, namely 11 people who complete. In group discussions, students also have not been seen to be active in the learning process so that it affects student learning outcomes and only students who have high abilities are active while others only receive answers from their friends.

On January 20, 2021, the researcher also made observations to identify the description of the mathematics learning process that took place in the classroom. From the results of these observations obtained the fact that teachers carry out learning using conventional learning models, namely learning with the lecture method, question and answer, and giving exercises. The lecture method is explaining the material directly to students. the teaching and learning process is more teacher centered. So that students' activities are more listening, taking notes, and then working on the questions given by the teacher.

[5] The unsatisfactory condition of students' learning methods and results of mathematics, among others, students learning mathematics only imitated and recorded the problem solving from the teacher. Mathematics does not involve students in active learning, emphasizes less on student understanding and students only accept teacher explanations.

The researcher saw that when starting the lesson the teacher rarely motivated students, the teacher immediately explained the material. In addition, students are still reluctant to ask the teacher if they do not understand the material, and some students still do not pay attention to the teacher's explanation because they are busy with their own activities.

Such learning conditions cause teachers to have an important role in the learning process. Teachers should be ready to act as facilitators and mediators, who choose constructive, varied, innovative, fun and meaningful learning models so that students can activate their learning activities. [6] The teacher should be able to activate all students in the class, one way is by asking questions in the middle of learning to students.

[7] in the learning system teachers are required to be able to choose the right learning method, be able to choose and use learning facilities, be able to choose and use evaluation tools, be able to manage learning in the classroom and in the laboratory, master the material, and understand the character of students.

[8] said that the teacher as a teacher who transfers knowledge and as a mentor who encourages students' potential in learning. This means that the teacher has the duty and responsibility to master the knowledge to be taught, has a set of knowledge, teaching technical skills, and displays a personality that is able to be an example for students. Thus, it will directly affect the learning outcomes of mathematics.

By looking at the lack of active students in the classroom, it is necessary to apply learning strategies that encourage students to be active. Some of the things that make

students active, namely the involvement of teachers motivate students at the beginning of learning it is useful to arouse students' curiosity and interest, explore students' knowledge through group discussions, give students the opportunity to express opinions, apply the concepts learned to the material in everyday life, evaluate knowledge by asking questions and drawing conclusions.

There is a need for a learning model that can foster a spirit of learning and strengthen students' memory of the material being studied so that it can support the creation of conducive teaching and learning activities [9]. One of the learning models that is conducive and involves the active role of students is the Learning cycle 5E learning model. [10] stated that the Learning Cycle 5E learning model has phases that can be oriented to the 2013 Curriculum so that it can train students' science process skills. Students can play an active and motivated role in developing skills. This is in accordance with [11] which states that the characteristics of the learning cycle learning model always provide opportunities for students to find, apply, and use student learning styles and students play an active role during the learning process and can improve learning outcomes.

Through this learning model, teachers can generate motivation and interest in student learning. Students are expected to play an active role and interact with fellow students through group discussions, express opinions, develop and apply concepts, and explain concepts in their own language so that they obtain better learning outcomes.

Based on the explanation that has been put forward, the researchers want to try to improve the mathematics learning outcomes of students in class X.A. AKL at the Riau Taxation Vocational School by applying the Learning Cycle 5E learning model.

This research was conducted to improve the learning process and improve mathematics learning outcomes for students of class X SMK Riau Taxation for the 2020/2021 academic year, on arithmetic sequences and series material through the application of *Learning Cycle 5E (LC5E)*.

2. RESEARCH METHOD

This type of research uses Classroom Action Research (CAR). According to [12] CAR consists of research, action, and class. Research is an activity of observing an object by using certain methodological rules to obtain data and information that is useful in improving the quality of a matter, as well as attracting interest and importance for researchers. Action is an activity that is intentionally carried out with a specific purpose, while the class is a group of students who at the same time receive the same lesson from a teacher.

[13] said that Classroom Action Research is one of the important inquiry processes to be carried out by teachers in order to improve the quality of the process and student learning outcomes. In classroom action research (CAR), the teacher acts as a researcher in a class that he manages himself. The research was carried out at the Riau Tax Vocational School in the even semester of the 2020/2021 academic year. The research subjects were students of class X.A AKL at the Riau Taxation Vocational School, totaling 24 people, consisting of 21 women and 3 men.

The research instrument consists of learning tools and data collection instruments. The learning tools used in this study were the syllabus, lesson plan (RPP), and student activity sheets (LKPD). The data collection instrument in this research is data about teacher and student activities during the learning process and data about students' mathematics learning outcomes after the learning process. The data was collected through observation sheets and learning outcomes tests in the form of Daily Tests (UH).

The techniques used to collect data in this study were interview techniques, observation techniques, and test techniques. Interviews were conducted so that researchers get in-depth information, observation techniques were used to obtain data on teacher and student activities during the learning process, and data on student learning outcomes were collected through tests by conducting daily tests.

Data analysis techniques in the form of qualitative data analysis and quantitative data analysis. Qualitative data analysis in this study is an analysis of teacher and student activities obtained from observations during the learning process. Analysis of quantitative data in this study seen from the basic score, tests I and II were analyzed to see an increase in student learning outcomes with student achievement of the KKM, which was obtained from students' mathematics learning outcomes after taking the action.

KKM achievement analysis to describe students' abilities in terms of mastery learning. The KKM set for mathematics at the Riau Tax Vocational School is 65. To determine the achievement of the KKM, it can be done by calculating individual completeness and the percentage of classical completeness. The formula used [14] is:

$$KI = \frac{SS}{SMI} \times 100 \quad \text{and} \quad KK = \frac{JST}{JS} \times 100\%$$

Description:
KI = Ketuntasan individu
SS = Skor hasil belajar siswa
SMI = Skor maksimal ideal
KK = Persentase ketuntasan klasikal
JST = Jumlah siswa yang tuntas
JS = Jumlah siswa keseluruhan

The improvement of student learning outcomes in action research is also seen from the average value of student learning outcomes. if the average value on daily tests I and II increases, it is said that student learning outcomes have increased and the action is successful. The formula used to calculate the average is:

$$\bar{X} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n} \quad [15]$$

Description:
$\bar{X}$: Mean
n : Many Students
$x_1 + x_2 + x_3 + \cdots + x_n$: Total Score of All Students

3. RESULTS AND DISCUSSION

Research Results

Based on research by applying the Learning Cycle 5E learning model, it can improve the learning process and increase mathematics learning outcomes, this can be seen from every meeting. And the increase in learning outcomes can be seen from the quantitative analysis in the analysis of the average learning outcomes, namely the basic score of 59.79, in the first cycle of 66.04 and in the second cycle of 72.29.

Table 1. KKM Achievement Analysis

	Base Score	UH I	UH II
Number of students who reach KKM	11	15	17
Classical Completeness	45%	62,50%	70,83%

Students who reach the KKM experience an increase in daily test 1 and daily test 2. This can be seen in the analysis of quantitative data, namely the analysis of the Achievement of Minimum Completeness Criteria (KKM). people (62.50%) and on daily test 2 increased by 2 people from daily test 1 to 17 people (70.83%). In addition to experiencing an increase in the average learning outcomes and students who reach the KKM, the qualitative analysis based on the activity sheets of teachers and students in implementing Learning Cycle 5E shows that there has been an improvement in the learning process.

Based on the description above, it can be concluded that the application of Learning Cycle 5E can improve the learning process and improve the mathematics learning outcomes of class X.A AKL students. This is in line with the research of Desti Mulyani, Rahma Budiman and Herma Afrianti who concluded that the application of Problem Posing could improve the learning process and improve learning outcomes in mathematics. So the results of this action analysis can support the proposed action hypothesis, namely the application of Learning Cycle 5E can improve the learning process and improve mathematics learning outcomes for class X.A AKL students at the Riau Taxation Vocational School in the even semester of the 2020/2021 academic year on the subject matter of arithmetic sequences and series.

In implementing the actions in this research, of course there are still weaknesses experienced by both teachers and researchers/observers. These weaknesses include:

1. Inappropriate time planning, teachers have not been able to manage time according to the lesson plan so that the learning process is not optimal
2. In cycle 1, the researcher was less than optimal in discussing the steps of learning activities with the teacher, so there were activities that were not carried out.

3. There are still some students who are reluctant to ask the teacher when the teacher invites students to ask material that has not been understood.

Hopefully the explanation above can be a reference for future researchers so that they can further maximize existing capabilities and can carry out better and more useful research.

4. CONCLUSION

Based on the results of the research and discussion, it was concluded that the application of Learning Cycle 5E learning can improve the learning process and improve mathematics learning outcomes for students in class X.A Financial Accounting Institutions (AKL) at the Riau Taxation Vocational School on the subject matter of arithmetic sequences and series for the even semester of the 2020/2021 academic year.

REFERENCE

[1]   N. Y. Suriati, Alzaber, and P. Wahyuni, "Penerapan model pembelajaran kooperatif tipe course review horay (CRH) untuk meningkatkan hasil belajar matematika siswa kelas IX SMP Swasta Yayasan Pendidikan Persada Indah Perawang," *J. aksiomatik*, vol. 7, no. 20, pp. 18–24, 2019.

[2]   R. A. Ariesta, "Peningkatan Hasil Belajar Matematika Siswa dengan Pendekatan Realistic Mathematics Educatin (RME) Kelas VIII SMP Negeri 2 Rengat Barat," *AKSIOMATIK J. Penelit. Pendidik. dan Pembelajaran Mat.*, vol. 8, no. 3, pp. 109–116, 2020.

[3]   A. Alzaber and S. Amelia, "Penerapan Teknik Icebreaker dalam Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) untuk Meningkatkan Motivasi Belajar Siswa Kelas V SD An-Namiroh Pusat Pekanbaru," *AKSIOMATIK J. Penelit. Pendidik. dan Pembelajaran Mat.*, vol. 7, no. 1, pp. 41–47, 2019.

[4]   Depdiknas, *Penerapan Ketuntasan Minimum (KKM)*. Jakarta: Departemen Pendidikan Nasional, 2006.

[5]   R. Fuadi, R. Johar, and S. Munzir, "Peningkatkan kemampuan pemahaman dan penalaran matematis melalui pendekatan kontekstual," *J. Didakt. Mat.*, vol. 3, no. 1, pp. 47–54, 2016.

[6]   F. Lestari, R. Marta, and V. Indah, "Penerapan Model Pembelajaran Probing Prompting untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis," *J. Teach. Educ.*, vol. 2, no. 1, pp. 247–255, 2020.

[7]   B. Wulandari and H. D. Surjono, "Pengaruh problem-based learning terhadap hasil belajar ditinjau dari motivasi belajar PLC di SMK," *J. Pendidik. vokasi*, vol. 3, no. 2, 2013.

[8]   D. Fimansyah, "Pengaruh Strategi pembelajaran dan minat belajar terhadap hasil belajar matematika," *Judika (Jurnal Pendidik. UNSIKA)*, vol. 3, no. 1, 2015.

[9]   N. Y. Suriati, "Penerapan Model Pembelajaran Kooperatif Tipe Course Review

Horey (CRH) untuk Meningkatkan Hasil Belajar Matematika Siswa Kelas IX SMP Swasta Yayasan Pendidikan Persada Indah Perawang." Universitas Islam Riau, 2018.

[10]   D. Astriani and N. N. Istiqomah, "Model pembelajaran learning cycle 5E: Mengaktifkan siswa pada materi suhu dan perubahannya," *J. Penelit. Pendidik. IPA*, vol. 1, no. 2, pp. 71–75, 2016.

[11]   P. Partini, B. Budijanto, and S. Bachri, "Penerapan Model Pembelajaran Learning Cycle 7E untuk Meningkatkan Kemampuan Berpikir Kritis Siswa," *J. Pendidik. Teor. Penelitian, dan Pengemb.*, vol. 2, no. 2, pp. 268–272, 2017.

[12]   D. S. Mulia and S. Suwarno, "PTK (Penelitian Tindakan Kelas) dengan pembelajaran berbasis kearifan lokal dan penulisan artikel ilmiah di SD Negeri Kalisube, Banyumas," *Khazanah Pendidik.*, vol. 9, no. 2, 2016.

[13]   A. W. Jufri, "Penelitian Tindakan Kelas: Antara Teori Dan Praktek," *J. Pijar MIPA*, vol. 5, no. 2, 2010.

[14]   T. Wahyuningsih and S. Rezeki, "Perbandingan Hasil Belajar Matematika Siswa Melalui Penerapan Model Pembelajaran Langsung Dengan Pembelajaran Kooperatif," *J. Mat.*, vol. 3, no. 2, pp. 1394–1693, 2013.

[15]   G. Utami, F. Julian, A. Fadilah, E. Harahap, F. Badruzzaman, and D. Darmawan, "Pembelajaran Mengenai Penyelesaian Pengolahan Data Statistika Secara Efektif Menggunakan Speq Mathematics," *Teknol. PEMBELAJARAN*, vol. 4, no. 2, 2019.