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CONTEXTUAL TEACHING AND LEARNING APPROACH BASED ON TPACK TO INCREASE STUDENTS' INTEREST IN LEARNING AND LEARNING OUTCOMES

Ali Wardoyo[1*], Sunismi[2]
[1,2]Department of Mathematics Education, Universitas Islam Malang, Malang, East Java, Indonesia
*Correspondence: 22302072004@unisma.ac.id

ABSTRACT

This research is a Classroom Action Research (CAR) using Contextual Teaching and Learning (CTL) approach based on TPACK to increase students' interest and learning outcomes. The study involved 22 students of class VII at MTsN 2 Tanah Bumbu, with data collection techniques including observation, written tests, and questionnaires. The results showed that the CTL approach significantly increased students' interest in learning, with their attention to math increasing from 54.55% to 81.82% after the action. In addition, students' feelings of pleasure increased from 36.36% to 77.27%, and their interest in mathematics increased from 31.82% to 63.64%. The CTL approach also improved learning outcomes, with an increase in the average learning outcomes and the level of KKTP (Criteria for Completion of Learning Objectives). The average learning outcome before the action was 46.4, and in cycle I it increased to 59.5 with a completeness percentage of 54.5%. In cycle II, it reached a significant increase of 74.5 with a percentage of 100% completeness.

Keywords: Contextual Teaching and Learning, TPACK, Learning Interest, Learning Outcomes

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PRELIMINARY

Learning is a dynamic interaction that aims to gain new knowledge, skills, and experiences from various sources. Learning is a process of student interaction with educators and learning resources in a learning environment (Kemendikbud, 2003). According to Watini (2019), learning achievement from continuous interaction with the environment, where the environment is constantly changing.

Based on Permendikbud No. 36 of 2018, in primary and secondary education, the main objectives of mathematics are for students to (1) use patterns as conjectures in problem-solving and be able to make generalizations based on existing phenomena or data, (2) use reasoning on properties and perform mathematical manipulation both in simplifying and analyzing existing components in problem-solving; and (3) communicate ideas, reasoning, and abilities to find solutions to complex problems. This has an impact on

students who must learn the skills of learning mathematics. One of the conditions for students to master various mathematical skills is to foster an interest in learning. This is very important, because without students' interest in learning mathematics, it will be very difficult to learn skills in learning mathematics.

Based on the results of the summative assessment at the end of the odd semester of the 2023–2024 academic year, students' learning outcomes in class VII MTsN 2 Tanah Bumbu are low. This can be seen from the data on the results of KKTP completeness: as many as five students received the title of complete, while 17 other students did not. In addition, students' interest in math subjects is also low. Based on observations during learning and questionnaires with several students, information was obtained that mathematics material was less attractive, causing students to lack interest in learning mathematics. Students' interest in learning can foster a heightened attention to the learning process. Students' interest in learning can be seen through four indicators: attention, interest, pleasure, and participation (Septiani et al., 2020). According to Firdaus (2019), one of the factors causing low interest in learning mathematics is interest; namely, 35% interest in mathematics material affects students' interest in learning mathematics. One of the critical efforts to overcome this problem is ensuring that the classroom learning process has sufficient attractiveness and relevance to increase students' interest in learning. Learning interest plays an essential role in the learning process of students because learning interest can foster the spirit of learning, encouraging them to do something (Indana & Azizah, 2021).

Mathematics learning applied in schools is generally still teacher-centered (Yahya & Bakri, 2020). According to Hana et al. (2019) mathematics learning is still less effective because it is more teacher-centered. In this case, teacher-centered means that the teacher dominates the learning process, while students seem to only receive information conveyed by the teacher without involving the process of finding it. This needs to be changed to learning centring on learner activities, considering their interest in learning. Learners' interest in learning directly impacts their level of participation, understanding of concepts, and overall academic achievement. Furthermore, Islamiah (2019) concluded that learning interest significantly positively affects student learning outcomes. Then, Nugroho et al., (2020) stated that there is a significant favorable influence between interest in learning and student learning outcomes.

In order to foster students' interest in learning, teachers must be able to design and implement exciting learning. One of the lessons that can increase students' interest is to use

the Contextual Teaching and Learning (CTL) learning approach. The CTL approach emphasizes the direct experience of students in building their knowledge (Raherka et al., 2023). The Contextual Teaching and Learning (CTL) learning model is a learning and teaching thinking approach that helps teachers connect subject matter with current reality. The CTL learning model is a relevant approach strategy (Oktapia & Siregar, 2023). Then, according to Octavyanti & Wulandari (2021), learning with a contextual approach prioritizes the ability of students to create knowledge and discoveries through themselves. This allows learners to explore their thinking as they acquire knowledge and experience new things. Furthermore, according to Setiawan & Sudana (2019), there are seven contextual learning principles. These principles are: (1) constructivism, which serves as the main foundation of contextual learning as it argues that human knowledge is acquired gradually rather than instantly; (2) Discovering, the main activity in contextual learning, emphasizes that knowledge is acquired from personal human experience rather than remembering; (3) The habit of questioning: the habit of questioning is an essential component in contextual learning as often knowledge starts from curiosity about a phenomenon; (4) Learning community: This means that knowledge emerges as a result of human interaction and cooperation, which produces a different understanding from what people previously knew; (5) In modeling, the teacher not only acts as a learning resource but also acts as a facilitator who helps students explore knowledge through various available sources; (6) Reflection is a process of rethinking events that have occurred and internalizing them into existing knowledge; and (7) authentic assessment cannot be separated from the contextual learning process.

In addition to applying the contextual teaching and learning (CTL) approach, learning interest can be increased using suitable learning media. According to Nurmala & Mucti (2019), students' lack of interest in learning is caused by unattractive mathematics learning media. One media that students are interested in learning about is technology-based.

According to Munawaroh et al., (2021), information technology-based learning can trigger interest in education, increase creativity, and make it easier for students to understand the material. Then, using digital media can increase students' interest and provide good (Nurjanah & Mukarromah, 2021).

Using technology in learning combined with relevant pedagogical materials is called TPACK. According to Mishra & Koehler (2006), TPACK is a learning model combining various knowledge elements. This framework combines technology, education,

and knowledge content to achieve learning objectives. There are three main components in TPACK, namely: (1) technology, which includes the ability to apply various technologies in education, including learning support devices and educational applications that have now developed rapidly; (2) pedagogy, which is the ability that teachers must have, such as planning, implementing, and assessing learning in order to achieve optimal learning objectives; (3) knowledge content, which includes the ability to present content that meets learning objectives and to evaluate the quality of content used in the learning process.

Therefore, this research focuses on applying the Contextual Teaching and Learning (CTL) approach that allows students to engage in meaningful and contextual learning. In this context, the integration of Technological Pedagogical Content Knowledge (TPACK) becomes crucial to optimizing the use of technology in order to improve students' interest and learning outcomes.

The situation at MTsN 2 Tanah Bumbu shows that students' interests could be higher, especially in mathematics. Based on the results of observations and questionnaires given to students, it is stated that the interest in learning mathematics of class VII students at MTsN 2 Tanah Bumbu is low. Therefore, MTsN 2 Tanah Bumbu was chosen as the research location because of its representativeness of the junior secondary education environment, which may face unique challenges in increasing students' interest in learning. Based on the description above, the objectives of this research are:

1. To increase students' interest in learning in class VII MTsN 2 Tanah Bumbu through learning with a contextual teaching and learning (CTL) approach based on TPACK.
2. Improving students' learning outcomes in class VII MTsN 2 Tanah Bumbu through a contextual teaching and learning (CTL) approach based on TPACK.

METHODS

The type of research carried out is classroom action research (CAR). CAR is practical research that aims to implement planned actions to improve weaknesses and deficiencies in classroom learning. According to Sunengsih et al. (2023), classroom action research is research conducted by teachers to improve problems in the classroom. The subjects of this study were 22 students in class VII at MTsN 2 Tanah Bumbu. Data collection techniques include observation, written tests, and questionnaires. The instruments of this study consisted of observation sheets, written test questions in the form of descriptions consisting of five questions, and questionnaire sheets of learning interest.

The obtained data were then triangulated to be analyzed. The planned actions will include applying TPACK-based contextual learning models to improve students' interest and learning achievement.

This class action research consists of four stages: planning, implementing (action), observing and evaluating the process and results (observation and evaluation), and reflecting (reflection), according to Arikunto (Prasetyo, 2021). After conducting reflection actions, which include analyzing, synthesizing, and assessing the results of observing the process and actions taken, problems or thoughts that need to be improved usually arise. As a result, planning, action, observation, and reflection need to be repeated until a problem is considered solved; this process continues. CAR can be considered complete when all the indicators have been met.

In this study, qualitative and quantitative data analysis techniques were used. Quantitative analysis techniques are used to analyze the results of written tests conducted by students. The purpose of analyzing the results of this test is to determine whether students have reached a higher level of completeness. The indicator of the level of completeness is adjusted to the Criteria for Completeness of Learning Objectives (KKTP) at school, namely, "Students will be declared complete in each test if they get a minimum score of 60.".

The average score of students' tests was obtained using the formula:

$$X = \frac{\sum X}{N} \quad (1)$$

Description:
X =Average learner score

$\sum X = Total\ number\ of\ learners'\ scores$
$N = Number\ of\ learners$

Data on students' test results are made with table qualifications as follows:

Table 1. Learners' Learning Outcomes

Learners' scores	Qualification
87 – 100	Very good
73 – 86	Good
60 – 72	Fair

Learners' scores	Qualification
36 – 59	Poor
0 – 35	Very Poor

(Criteria for Completeness of Learning Objectives on "Rapor Digital Madrasah" = 60)

While qualitative data analysis techniques are used to determine the questionnaire results, The purpose of the questionnaire is to determine the increase in students' interest in learning after taking action.

Table 2. Students' Interest in Learning

No.	Aspects	Before Action	After Action
1	Attention		
2	Feeling of pleasure		
3	Interest		
4	Participation		

(Septiani et al., 2020)

RESULTS AND DISCUSSION

The classroom action research carried out has gone through several stages, including planning, implementation, observation, and reflection. Then it is repeated in cycles until it meets the targets set at the beginning.

Cycle I

a. Planning

In the planning stage, the researcher compiled lesson plans along with the targets to be achieved with a contextual approach, namely raising problems in everyday life to be more easily understood by students, then making TPACK-based learning media by utilizing wordwall and Quizizz applications. In addition, researchers also prepare the worksheets and research instruments needed so that every event in the classroom can be well documented.

b. Implementation

At the implementation stage, students are given pretest questions to determine the achievement of learning outcomes and questionnaires to determine students' interest in learning mathematics. Data on students' pretest results can be seen in the following table:

Table 3. Pretest Result

No.	Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Number of Correct Answers	Score
1	S1	1	0	0	1	0	1	0	0	1	0	4	40
2	S2	1	1	0	0	1	0	1	0	1	1	6	60
3	S3	0	0	0	1	0	0	1	0	1	1	4	40
4	S4	0	0	0	0	1	0	0	0	1	0	2	20
5	S5	1	2	0	1	1	0	1	0	1	1	8	80
6	S6	0	1	0	1	0	0	1	0	1	1	5	50
7	S7	1	0	0	1	0	0	1	0	1	1	5	50
8	S8	0	0	0	1	0	0	1	0	1	1	4	40
9	S9	0	0	0	1	1	1	1	0	1	0	5	50
10	S10	1	1	0	1	1	1	0	1	1	1	8	80
11	S11	0	0	0	0	0	0	0	0	1	0	1	10
12	S12	1	1	0	0	1	1	1	1	1	1	8	80
13	S13	0	0	0	1	1	1	0	0	1	0	4	40
14	S14	0	1	0	1	0	0	0	0	1	1	4	40
15	S15	1	1	0	0	1	1	0	1	1	0	6	60
16	S16	1	1	0	1	0	0	0	0	1	0	4	40
17	S17	0	1	0	1	1	0	0	1	0	0	4	40
18	S18	0	1	0	1	1	0	0	0	1	0	4	40
19	S19	1	0	0	0	0	0	0	0	1	1	3	30
20	S20	0	0	0	1	1	0	0	0	1	0	3	30
21	S21	1	0	1	1	0	0	0	0	1	1	5	50
22	S22	0	1	0	1	1	0	1	0	1	1	6	60

After the pretest, the researcher provides action in accordance with the planned lesson plan, namely learning with a TPACK-based contextual approach. Learning begins by providing perception and motivation in the form of problems around students by utilizing the Wordwall application. Then students are given worksheets that have been made in such a way that they can be completed in groups. Learners are given the freedom to work on worksheets outside or indoors so that the results are more optimal. Then group representatives are asked to present the results of their discussions and are responded to by other groups.

The next activity is to evaluate at the end of learning by utilizing Quizizz. There are 10 questions made by researchers to find out the extent of students' learning outcomes after the implementation of actions in cycle I. The learning outcomes of students in cycle I can be seen in the following table:

Table 4. Learning Outcomes Cycle I

No.	Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Number of Correct Answers	Score
1	S1	1	1	1	1	0	1	0	0	1	0	6	60

No.	Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Number of Correct Answers	Score
2	S2	1	1	0	0	1	0	1	1	1	1	7	70
3	S3	1	1	1	1	1	0	1	0	1	1	8	80
4	S4	0	0	0	0	1	1	0	1	1	0	4	40
5	S5	1	2	1	1	1	0	1	0	1	1	9	90
6	S6	0	1	1	1	0	0	1	0	1	1	6	60
7	S7	1	0	1	1	0	0	1	0	1	1	6	60
8	S8	1	0	1	1	0	0	1	0	1	1	6	60
9	S9	0	1	0	1	1	1	1	0	1	0	6	60
10	S10	1	1	0	1	1	1	0	1	1	1	8	80
11	S11	0	1	0	1	0	1	0	0	1	0	4	40
12	S12	1	1	0	0	1	1	1	1	1	1	8	80
13	S13	0	0	0	1	1	1	0	0	1	1	5	50
14	S14	0	1	0	1	0	0	0	1	1	1	5	50
15	S15	1	1	1	0	1	1	0	1	1	0	7	70
16	S16	1	1	0	1	0	0	1	0	1	0	5	50
17	S17	0	1	0	1	1	0	1	1	0	0	5	50
18	S18	0	1	0	1	1	0	1	0	1	0	5	50
19	S19	1	0	0	0	0	0	0	1	1	1	4	40
20	S20	0	0	0	1	1	0	0	1	1	0	4	40
21	S21	1	1	1	1	0	0	0	0	1	1	6	60
22	S22	0	1	0	1	1	0	1	1	1	1	7	70

c. Observation

During the implementation of the action, the researcher observed and recorded every important event that occurred in the classroom. It is intended that any important information needed can be obtained maximally. In addition, observation also serves as comparative data obtained from various instruments.

d. Reflection

In the reflection stage, researchers looked at various data that had been obtained based on the actions in the first cycle. There were several findings during the action in cycle I, namely: 1) Students are not yet familiar with the use of technology in learning, so researchers need to explain and provide examples of the use of media that has been made; 2) There is one question that is not clear, so it is necessary to explain it to students; and 3) Group activities have not run optimally because there are some passive group members. The qualifications of students' learning outcomes at the end of cycle I can be presented in the form of the following table:

Table 5. Learners' Learning Outcomes Cycle I

No.	Learners' scores	Number of Learners	Percentage (%)	Qualification
1	87 – 100	1	4.55	Very good
2	73 – 86	3	13.63	Good
3	60 – 72	9	40.91	Fair
4	36 – 59	9	40.91	Poor
5	0 – 35	0	0.00	Very Poor

Cycle II

a. Planning

Based on the results of the reflection on cycle I, the researcher made several improvements so that the implementation of actions in cycle II went better. Improvements made by researchers exist by explaining the description of the learning that will be carried out so that students can participate in learning optimally. Besides that, researchers also improve learning outcomes evaluation tools in the form of test questions.

b. Implementation

Researchers provide action in accordance with the improved lesson plan, namely learning with a TPACK-based contextual approach. Learning begins by providing perception and motivation in the form of problems that exist around students by utilizing the Wordwall application. Then students are given worksheets, which have been made in such a way that they can be completed in groups. Learners are given the freedom to work on worksheets outside or indoors so that the results are more optimal. Researchers also provide intensive assistance so that the discussion goes well. Then group representatives were asked to present the results of their discussions, which were responded to by other groups.

The next activity is to evaluate at the end of learning by utilizing Quizizz. There are 10 questions made by researchers to find out the extent of students' learning outcomes after the implementation of actions in cycle II. The learning outcomes of students in cycle II can be seen in the following table:

Table 6. Learning outcomes cycle II

No.	Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Number of Correct Answers	Score
1	S1	1	1	1	1	0	1	0	0	1	1	7	70
2	S2	1	1	0	0	1	1	1	1	1	1	8	80
3	S3	1	1	1	1	1	0	1	0	1	1	8	80
4	S4	1	0	0	0	1	1	1	1	1	0	6	60

No.	Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Number of Correct Answers	Score
5	S5	1	2	1	1	1	0	1	0	1	1	9	90
6	S6	1	1	1	1	1	0	1	0	1	1	8	80
7	S7	1	1	1	1	0	1	1	0	1	1	8	80
8	S8	1	0	1	1	0	0	1	1	1	1	7	70
9	S9	0	1	0	1	1	1	1	1	1	1	8	80
10	S10	1	1	0	1	1	1	1	1	1	1	9	90
11	S11	1	1	0	1	1	0	0	1	1	0	6	60
12	S12	1	1	0	1	1	1	1	1	1	1	9	90
13	S13	0	0	0	1	1	1	1	1	1	1	7	70
14	S14	0	1	0	1	1	0	1	1	1	1	7	70
15	S15	1	1	1	1	1	1	0	1	1	0	8	80
16	S16	1	1	0	1	1	1	1	0	1	0	7	70
17	S17	1	1	0	1	1	1	1	1	0	0	7	70
18	S18	1	1	0	1	1	1	1	0	1	0	7	70
19	S19	1	0	0	1	0	0	1	1	1	1	6	60
20	S20	0	0	1	1	1	0	1	1	1	0	6	60
21	S21	1	1	1	1	0	0	1	1	1	1	8	80
22	S22	0	1	1	1	1	0	1	1	1	1	8	80

c. Observation

During the implementation of the action, the researcher observed and recorded every important event that occurred in the classroom. It is intended that any important information needed can be obtained maximally. In addition, observation also serves as comparative data obtained from various instruments.

d. Reflection

In the reflection stage, researchers looked at various data that had been obtained based on the actions in cycle II. There were no significant problems compared to cycle I. The action in Cycle II was relatively smooth and in accordance with the researcher's plan. Furthermore, the qualifications and improvement of students' learning outcomes at the end of cycle II can be presented in the form of the following table:

Table 7. Learners' Learning Outcomes Cycle II

No.	Learners' scores	Number of Learners	Percentage (%)	Qualification
1	87 – 100	3	13.64	Very good
2	73 – 86	8	36.36	Good
3	60 – 72	11	50.00	Fair
4	36 – 59	0	0.00	Poor
5	0 – 35	0	0.00	Very Poor

Table 8. Improvement in Learning Outcomes Between Cycles

No.	Learners' scores	Before action (%)	Cycle I (%)	Cycle II (%)	Qualification
1	87 – 100	0.00	4.55	13.64	Very good
2	73 – 86	9.09	13.63	36.36	Good
3	60 – 72	18.18	40.91	50.00	Fair
4	36 – 59	54.55	40.91	0.00	Poor
5	0 – 35	18.18	0.00	0.00	Very Poor

Average student learning outcomes for each cycle.

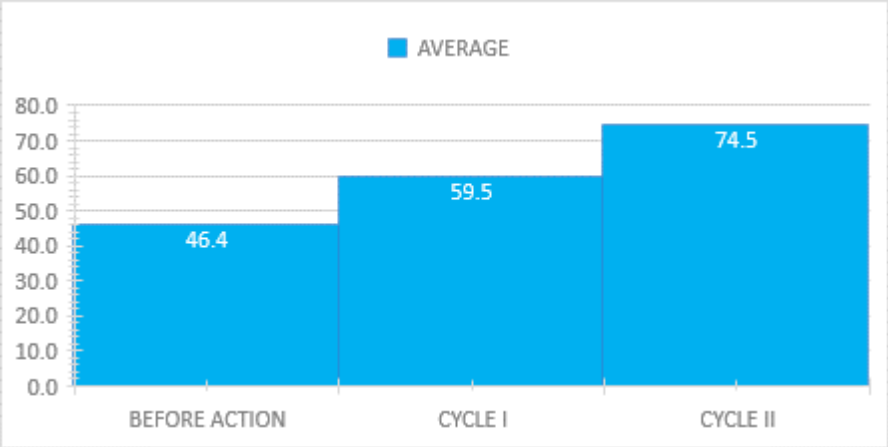

Figure 1. Average Score of Students

Table 9. Learner Learning Interest

No.	Aspect	Number of Learners	Before action (%)	Number of Learners	After action (%)
1	Attention	12	54.55	18	81.82
2	Feeling of pleasure	8	36.36	17	77.27
3	Interest	7	31.82	14	63.64
4	Participation	10	45.45	14	63.64

Based on the data from the results of learning research using the TPACK-based Contextual Teaching and Learning (CTL) learning model by the procedures, namely planning and preparation, implementation, observation, and reflection, The following is a discussion of the research results.

Based on Table 9, the research data is in the form of questionnaire results with students and observations to determine their learning interests, which were carried out in 2

cycles. Four indicators are used to determine students' interest in learning: 1) attention, 2) feelings of pleasure, 3) interest, and 4) participation. Questionnaires were given to students before the action and after the implementation of cycles 2. Based on indicator 1 in learning interest, the data obtained showed that students' attention was 54.55% before the action, and after receiving the action, it increased to 81.82%. This shows a significant increase in students' attention after receiving action in the form of TPACK-based CTL cooperative learning.

Furthermore, in the second indicator regarding the feeling of pleasure experienced by students, 36.36% was obtained before the action and increased to 77.27% after receiving the action. Learners felt happy with the learning that was carried out for two cycles. Learning that is carried out using word wall learning media combined with paper-based quizzes is a new thing that students feel, creating feelings of pleasure and interest. In indicator 3, student's interest in learning mathematics increased during the actions carried out in 2 cycles; the data before the action of 31 increased from 82% to 63.64%. Students' interest increased significantly in TPACK-based CTL cooperative learning; this proves that learning that combines cooperative learning with the application of TPACK is lovely to students. Then, in the fourth indicator, students' participation in mathematics also increased, from 45 percent before the action to 64% after the action. Based on the discussion above, TPACK-based CTL cooperative learning can increase students' interest in learning using the four indicators used. This result aligns with the research of Novalis et al., (2019), who concluded that the contextual approach could increase students' interest in learning.

Furthermore, by observing Figure 1 and Table 8, which contain data on the improvement of student learning outcomes, it can be described that before the action, students were given ten pretest questions in the form of multiple-choice questions to determine the level of student learning outcomes in algebraic material. The results show that many students still need to reach KKTP, which is 72.73%, with an average score of 46.4. The highest score, with a score of 80, was two people, while the lowest score, with a score of 10, was one person. There were no learners who achieved the qualification "very good." Instead, most learners got the qualification "less," which amounted to 54.55%.
Furthermore, students were given action by implementing TPACK-based CTL cooperative learning by utilizing paper-based Wordwall and Quizizz media. The results in cycle I obtained an average student learning outcome of 59.5. The highest score, with a score of 90, was one person, and the lowest score, with a score of 40, was four people, with a

KKTP completeness percentage of 54.5%. 4.55% of students got the qualification "very good," but not a few got the qualification "less" by 40.91%. This condition has improved compared to before, but not so significantly. Some factors that are still obstacles are the need for more readiness of students to participate in learning, learning using a word wall is not optimal, and there are still students who need help understanding instructions from the action giver (teacher). Based on the results of this reflection, the teacher improved planning and implementation in cycle II. After receiving sufficient improvements, the implementation of cycle II actions improved. This is indicated by an increase in the average learning outcomes of students to 74.5. This means an increase of 15 points from the average in cycle I. Furthermore, 13.64% of learners received the qualification "very good," and the percentage of completeness also increased to 100% complete KKTP, an increase of 44.5% compared to the first cycle. In other words, no learners obtained learning outcomes below KKTP.

TPACK-based learning implemented in this Classroom Action Research uses materials that have been arranged in such a way that it is easy for students to understand. In addition, it also utilizes the "*Wordwall*" and "*Quizizz*" applications as part of the technology contained in TPACK. Wordwall is an application used by researchers in the implementation of learning. Researchers utilize wordwalls to show random problems that will be selected by students and then solved in front of the class. If students have difficulty solving problems, they will be assisted by other students who are chosen to help. Furthermore, the Quizizz application is used by researchers to determine the learning outcomes of students. The Quizizz application contains 10 evaluation questions that are done by students individually at the end of the cycle. With the application of TPACK-based learning, it can increase students' interest. According to Ilmiyati & Maladona (2023) learning with the application of TPACK can provide significant positive changes in students' interest in learning. In addition to increasing students' interest in learning using TPACK can improve students' learning outcomes. This can be seen from the test results given at the end of cycle II, which showed that all students met the KKTP. Thus, TPACK-based learning can improve students' learning outcomes.This result is similar to the research of Setyawan et al. (2022), who concluded that learning using TPACK can improve student learning outcomes.

CONCLUSION

Based on the results and discussion, it can be concluded that students' interest in learning using TPACK-based CTL learning has increased significantly. This can be seen from the three indicators of interest, namely attention, feelings of pleasure, and interest, all of which have increased. In addition, the learning outcomes of students also increased; this can be seen in the fact that the fact that the average results of students' learning outcomes at the end of the cycle always increased.

Based on the research results and conclusions above, the researcher provides input for future researchers to conduct more in-depth research related to this study. Furthermore, when choosing learning media, it should be tailored to the needs of students. In addition, future researchers can also use several approaches to increase students' interest and learning outcomes.

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