Integrating Kahoot with the Student Team Achievement Division Model to Foster Students Participation and Learning Outcome

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ABSTRACT

This study addresses the inadequate engagement and academic performance of vocational high school students. The aims of this study were to determine the improvement in activity and learning outcomes of ten grader of accounting vocational high school students. The subjects of this study were 24 accounting class students. This research method is Classroom Action Research. Data collection techniques are activity observation sheets, documentation and learning outcomes tests. Data analysis techniques are quantitative data analysis and qualitative data analysis. From the student activity observation sheet in cycle 1 there were 33.3% who fell into the very active and active categories but did not meet the indicators. In cycle 2 students who were in the very active and active categories increased to 83.3% and had met the success indicator ≥75%. From the results of data analysis obtained learning outcomes test data with an average value of pre test 44,7 with 4 students (16.67%) and posttest cycle 1 with an average value of 57,8 with 11 students (45.83%) and increased in posttest 2 results with an average value of 80.4 with 21 students (87.50%) and has met the success indicator ≥75%. These findings prove that the application of the STAD model assisted by Kahoot is effective in increasing student participation and learning outcomes.

How to cite:

Introduction

Active student engagement is essential for fostering an effective and significant learning experience. Active student engagement not only illustrates the dynamics of classroom interaction but also signifies that learning has become student-centered. Through active engagement, students serve as learning agents who deliberately generate information, enhance critical thinking abilities, and increase their comprehension of the subject matter. The extent of students' active engagement can indicate the teacher's effectiveness in fostering an inclusive, collaborative educational atmosphere that encourages substantial and profound learning to enhance better learning outcomes (Harrington et al., 2021; Abas, 2015).

Based on the results of initial observations conducted by researchers on ten graders accounting students at vocational high schools, it was found that the level of student learning activity was still low. From the 24 students, only 1 student was classified as very active and 3 students were active, while the majority of students were in the less active category and there was even 1 student who was not active at all. In addition, student learning outcomes also did not meet the minimum completion criteria of 70. Daily test data showed that on average only 37.5% of students achieved the standard minimum, then the other 62.5% had not completed it. This fact confirms that both student activity and learning outcomes are still below the expected standard. This condition is in line with the findings of Zanuarista & Sulistyowati (2020) which stated that low student learning activities will have a direct impact on less-than-optimal learning outcomes.

This condition of low activity and learning outcomes is in line with the opinion. Haryanto (2023) which states that activity is essential for learning to occur, because the continuation of effective learning is determined by student involvement. Suryani & Rini, (2023) also emphasizes that learning participation are participation that teachers give to students during the learning process, while Putri et al. (2022) states that learning is an activity that can bring about changes in students. Furthermore, Hamalik (2011) explains that learning outcomes can be observed through changes in a person's behavior after participating in a learning process, for example, from not knowing to knowing, or from not understanding to understanding. Meanwhile, Sudjana (2017) states that learning outcomes are the abilities students acquire after undergoing a learning process.

One learning model that can be used to improve student participation and learning outcomes is the Student Team Achievement Division (STAD) model. Student Team Achievement Division STAD is one of the simplest types of cooperative learning, making it suitable as a first step for teachers who are just beginning to learn about this approach (Aseany, 2021). Research by Irawati et al., (2021) also shows that the application of STAD in accounting subjects can significantly increase student engagement. The Student Team Achievement Division (STAD) model is designed to enhance interaction among students, enabling them to support and motivate one another in learning the material and achieving optimal learning outcomes (Wulandari, 2022). Student Team Achievement Division (STAD) means working together in teams by helping one another (Wulandari, 2022). Suratmin (2020) stated that the Student Teams Achievement Division (STAD) model is based on six steps, namely: 1) Communicating goals and motivating students, 2) Presenting/communicating information, 3) Organizing students into learning groups, 4) Guiding groups to work and learn, 5) Giving rewards, and 6) Evaluating. This is reinforced by research by Atikah et al. (2024) who found that cooperative learning strategies such as STAD are able to foster a sense of responsibility for learning and cooperation between students.

The Student Team Achievement Division (STAD) model will be combined with Kahoot. Kahoot is an interactive online learning platform that can be used to create quizzes. In this case, teachers act as question creators and administrators, while students act as players (Purnamasari et al., 2023). According to Zahra et al. (2023), kahoot is one of the interactive learning sites that allows users to create quizzes and educational games. Kahoot also serves as a means of assessing how well students understand the material that has been taught (Faznur et al., 2020). The use of Kahoot in the classroom can make learning activities more engaging and encourage students to be more enthusiastic about participating in lessons. Sakdah et al. (2021) proved that game-based Kahoot learning can increase student motivation, activeness, and learning outcomes in both online and face-to-face learning.

The selection of Kahoot as a medium in this study was based on its advantages as an interactive learning platform capable of creating a more engaging, competitive, and enjoyable learning environment. Kahoot provides immediate feedback and scores, encouraging students to participate more actively in answering questions and following the learning flow. Previous research also demonstrated Kahoot's effectiveness in improving learning outcomes, with students' average scores increasing from 65 to 80 after being implemented in the learning process (Anviani & Pujiriyanto, 2022). Therefore, combining the Student Team Achievement Division (STAD) model with Kahoot is logical, as the two complement each other. STAD plays a role in fostering interaction and collaboration through group discussions, while Kahoot strengthens individual engagement through technology-based quiz games that increase student participation.

The novelty of this research lies in the application of the Student Team Achievement Division (STAD) model combined with Kahoot media in basic accounting learning for vocational high school students. While previous studies have focused more on the effectiveness of STAD and Kahoot separately, this research presents an integration of both, thus combining the advantages of cooperative learning and interactive digital technology. Similar findings were also demonstrated by Zahra et al. (2023), who reported that digital learning applications were able to encourage more intensive engagement of vocational school students in learning activities. The significance of this research provides empirical evidence that integrating the STAD cooperative learning strategy with digital technology can sustainably increase student motivation and engagement. Additionally, these findings can serve as a reference for vocational educators in designing innovative learning that is oriented toward increasing student participation and learning outcomes. This demonstrates the urgency of research in the context of secondary education, particularly in vocational high schools, as it is able to offer effective, innovative, and relevant learning strategies with technological developments, while also providing concrete solutions to low student engagement and learning achievement in class.

Method

This research implemented by 3 stages, namely the preparation, research, reporting stages. This type of research is Classroom Action Research conducted in two cycles, each cycle consisting of four steps. The steps taken in this study are through four stages as follows: 1) Planning, 2) Implementation (Action), (Planning), 2) Implementation (Action), Observation, 4) Reflection. The preparation stage is similar to the planning stage in CAR.

Its primary focus is on preparing everything necessary before the action begins. Activities undertaken by researchers include developing teaching modules, determining teaching materials, and developing research instruments, such as observation sheets and

learning outcome test questions. At this stage, researchers prepare the equipment to be used in the research. The research stage integrates two key stages in CAR implementation (action) and observation. This stage is the core of the research, where actual actions are taken and data is collected. Implementation is when teachers implement the planned learning model, namely Student Team Achievement Division (STAD), using Kahoot. Simultaneously, observations are conducted to record student activities using observation sheets and measure their learning outcomes through tests (pre-test and post-test). The reporting stage aligns with the reflection stage in CAR, which is a process of critical evaluation and data synthesis. At this stage, researchers analyze all quantitative data from the learning outcome test and qualitative data from observations. This analysis aims to evaluate the effectiveness of the intervention and identify actions that require improvement. The results of this analysis are used as a basis for formulating research conclusions and providing recommendations for the next research cycle.

Particiapants

The subjects in this study were class X Accounting students of vocational high school in Binjai totaling 24 students, while the object of this research was the Accounting Learning Outcomes of Class X Accounting Students of vocational high school in Binjai in Basic Accounting learning competencies of Adjusting Journal through the Application of Student Teams Achievement Divisions (STAD) Model assisted by Kahoot Media. Data collection techniques used in this study are observation to measure student learning activities, documentation, and tests to measure basic accounting learning outcomes.

Data Collections

Data collection techniques included observation to measure learning activities, documentation, and tests (pre-tests and post-tests) to measure learning outcomes. This study used a mixed-methods approach: quantitative data were analyzed by calculating the average score, absorption rate (DS), and classical mastery (PK) to see the improvement in learning outcomes; qualitative data is analyzed descriptively through observation sheets that assess student activities on visual, verbal, listening, writing, motor, mental, and emotional indicators. The integration of both data is carried out at the reflection stage to assess the relationship between increased activity and increased learning outcomes, as well as a basis for improvement in the next cycle. The following is the formula used:

During the planning stage, researchers prepared detailed learning tools, including observation sheets containing visual, verbal, listening, writing, motor, mental, and emotional indicators, as well as pre-test and post-test instruments equipped with Kahoot-based interactive quizzes. The implementation stage was carried out by applying the Kahoot-assisted STAD model in accordance with the learning plan. Observations are made by recording student activities and learning outcomes using standardized instruments. The collected data is then analyzed in the reflection stage to evaluate the effectiveness of the actions and formulate improvements for the next cycle.

Data Analysis

Data analysis was conducted descriptively. Student activity data was presented in terms of numbers and percentages for each category, then compared between cycles to assess the achievement of success indicators, namely that at least 75% of students were in the active or very active category. Qualitative data in the form of observation results were described narratively to provide an overview of student learning activities, which were measured using the following scoring criteria: very active (24–28), active (19–23), fairly active (14–18), less active (9–13), and inactive (7–8). By analyzing the observation results and correlating them

with the test results, it is possible to determine the level of student participation as well as the improvement in learning outcomes from cycle to cycle. The learning outcome data were analyzed by comparing the average pre-test scores, post-test scores for cycle 1, and post-test scores for cycle 2, as well as calculating the number and percentage of students who achieved individual mastery. Learning mastery was declared achieved if at least 75% of the students obtained a score of ≥70, in accordance with the established classical mastery criteria.

Results and Discussion

Individually, students are considered active if they obtain a score of ≥19, with details of very active (24-28) and active (19-23). Based on the results of observations of student learning activities, there was an increase in student learning activities in cycle 1 compared to cycle 2. The increase in student learning activities in cycle 1 and cycle 2 can be seen in Table 1 below:

Table 1. Results of Student Learning Activity Observations in Cycle 1 and Cycle 2

Student Learning Activity Category	Cycle 1		Cycle 2	
	Number of Students	%	Number of Students	%
Very Active	2	8,3%	5	20,8%
Active	6	25,0%	15	62,5%
Moderately Active	10	41,7%	3	12,5%
Less Active	4	16,7%	1	4,2%
Inactive	2	8,3%	0	-

Based on Table 1, it can be seen that the percentage of students in the active and very active categories increased from 33.3% in cycle 1 to 83.3% in cycle 2. This increase indicates a significant improvement in student learning activities after the implementation of the STAD model assisted by Kahoot media. This finding is in line with the opinion of Aseany (2021), who argue that the STAD model, as a form of cooperative learning, is designed to strengthen interactions between students, encourage collaboration, and increase active engagement during the learning process.

From the analysis of student learning activity data on the activity observation sheet used in the application of the Student Team Achievement Division (STAD) model assisted by Kahoot media, it was found that the percentage of students included in the active category in cycle 1 was 33.3%. With the calculation of 8 active students divided by the total number of students, which is 24, multiplied by 100%, the result is 33.3%. Meanwhile, in cycle 2, the number of students included in the active category increased to 83.3% with the following calculation of 20 active categories divided by the total number of students, which is 24, multiplied by 100%, the result is 83.3%. Research by Irawati et al., (2021) also proved that the use of STAD in accounting learning contributed positively to increasing student participation.

The learning outcomes in this study were obtained from pre-tests and post-tests in each cycle. The results of both tests were used to determine the students' level of mastery of the material on adjusting journal entries for trading companies. The pre-test results were used to determine students' initial knowledge level before the intervention, while the post-test results from Cycle 1 were used to assess the improvement in students' learning outcomes after the implementation of the Student Team Achievement Division (STAD) model assisted by Kahoot media. The post-test results from Cycle 2 were used to observe the improvement in

students' learning outcomes from Cycle 1 after the implementation of the Student Team Achievement Division (STAD) model assisted by Kahoot media.

Table 2. Student Learning Outcomes Before and After Intervention

Test Type	Average Value	Complete		Incomplete	
		Number of Students	%	Number of Students	%
Pre-test	44,7	4	16,67	20	83,33
Post-test 1	57,8	11	45,83	13	54,17
Post test 2	80,4	21	87,50	3	12,50

Based on the data in Table 2 above, it is known that in the pre-test, there were 4 students who passed (16.67%) and 20 students who did not pass (83.33%), with an average score of 44.7. These pre-test results illustrate the students' learning outcomes before the intervention was carried out. In the post-test of Cycle 1, the number of students who achieved mastery increased to 11 students (45.83%), while the number of students who did not achieve mastery decreased to 13 students (54.17%), with an average score of 57.8. In Cycle 1, the targeted success indicators were not achieved despite an improvement from the pre-test to the post-test I. Therefore, the intervention was continued into Cycle 2.

In Cycle 2, the number of students who achieved mastery increased to 21 students (87.50%) with an average score of 80.4. The classical mastery in Cycle 2 has achieved the desired success indicator, where 75% of students have attended lessons and are able to achieve a score of ≥70 according to the Minimum Mastery Criteria (KKM) set by the school.
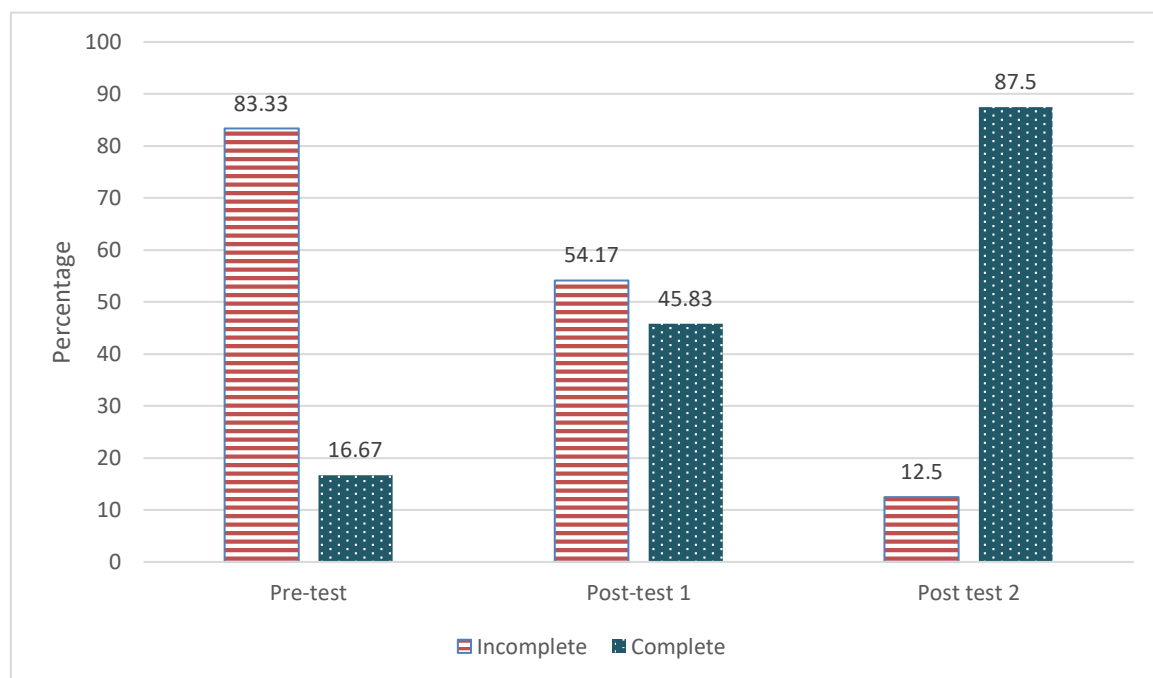

Figure 3. Improvement in Student Learning Outcomes

To measure the level of student learning completeness in mastering the subject of accounting, it is calculated by dividing the score obtained by the student by the maximum score multiplied by 100%. For example, to calculate the percentage of learning outcomes for a student with the initials AN who obtained a score of 80 on the post-test in cycle 1, the result is 80%. So the percentage of learning outcomes for the student with the initials AN is 80%. The same formula is used to calculate the results for the other students.

The class average is calculated by dividing the total score obtained by the students by the total number of students. From the data above, it can be seen that the class average continues to increase. The class average before the intervention was 44.7. In cycle 1, it became 57.8 (an increase of 13.1), and in cycle 2, it became 80.4 (an increase of 22.6).

Classical mastery is obtained by dividing the number of students who have mastered the material by the total number of students and then multiplying by 100%. Based on the results of the data analysis above, it is known that the classical mastery before the action was 16.67%, in cycle 1 it became 45.83% (an increase of 29.17%), and in cycle 2 it became 87.50% (an increase of 41.67%). Therefore, it can be concluded that hypothesis 2, namely that student learning outcomes can be improved by applying the Student Team Achievement Division (STAD) model assisted by Kahoot media to ten graders AKL students at vocational high schools in Binjai, is correct.

Based on the data in the student activity observation sheet, after implementing the Student Team Achievement Division (STAD) model assisted by Kahoot media, there was an increase in student activity from cycle 1 to cycle 2.

Visual Activities showed a positive increase, where in Cycle 1, the number of students meeting the criteria of frequently and very frequently engaging in this indicator was 12 students, meaning that some students were still not paying attention to the teacher during the learning process and group discussions, and were not reading the relevant journal adjustment material. In Cycle 2, this number increased to 21 students. This indicates that students are now focused and actively participating in the teaching and learning process, interested in reading the material, participating in group discussions led by the teacher, and presenting discussion results effectively.

Oral Activities showed that in Cycle 1, students tended to remain quiet and were hesitant to answer questions posed by the teacher verbally, unsure about expressing their opinions during discussions, and reluctant to ask questions. The number of students who frequently or very frequently performed this indicator was only 9 students, then in Cycle 2 it increased to 20 students. This is evident from students who are now brave enough to express their opinions during the learning process as well as in discussions, and are beginning to ask questions and answer during presentations by other groups.

Listening Activities showed an increase, with 14 students meeting the criteria of frequently and very frequently performing this indicator in cycle 1, increasing to 22 students in cycle 2. This means that almost all students have performed this activity, including listening to the teacher's explanation of the material, listening to others' opinions during discussions, and listening to groups giving presentations. In cycle 1, there were still students who did not listen to the teacher's instructions regarding learning or did not listen during the discussion process. This was evident when the teacher randomly asked students to explain what had just been discussed, but the students could not provide an explanation because they were not focused on listening to the lesson.

Writing Activities in Cycle 1, the number of students with the criteria of often and very often was 11 students. This was evident when in Cycle 1, some students did not take notes on the material being discussed, nor did they record the results of group discussions. This increased in Cycle 2 to 21 students. Students took notes on the material being discussed, and some students were also able to summarize and conclude the learning material in their adjustment journals.

Motor Activities in cycle 1 showed that many students were still slow and inaccurate in solving problems and answering questions. However, in cycle 2, the speed and accuracy of

students in answering questions on the material of journal entries for trading companies had improved from before. As seen in Cycle 1, the number of students in the often and very often categories for this indicator were only 9 students, which increased to 20 students in Cycle 2.

Mental Activities in Cycle 1 showed that the number of students in the often and very often categories for this indicator was 12 students, meaning that many students were not confident enough to ask questions, answer, or give feedback. In Cycle 2, this number increased to 19 students in often and very often categories.

Emotional Activities: In Cycle 1, the number of students who were classified as frequently and very frequently involved in learning was only 10 students. In Cycle 2, this number increased to 20 students who were enthusiastic and excited about the teaching and learning process, discussions, or completing assignments related to the material on adjusting journal entries for trading companies.

Conclusion

The implementation of the Student Team Achievement Division (STAD) model assisted by Kahoot media effectively improved student activity and learning outcomes in the 10th grade accounting class at vocational high school in Binjai in the 2024/2025 academic year. This can be seen from cycle 1, where the percentage of students who were active in learning activities reached 33.3%, while in cycle 2 it increased to 83.3%. Based on the comparison of activity scores between Cycle 1 and Cycle 2, it can be concluded that there was a 50% increase in student learning activities. Furthermore, the accounting learning outcome

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