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Gamification based Think Pair Share Model to Improve Student Performance and Learning Outcomes

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ABSTRACT

The aims of this study was to determine the increase in learning activities and learning outcomes of students in ten graders of a public vocational school majoring in accounting by applying the think pair share learning model accompanied by a gamification strategy. This study used the classroom action research method. The research subjects consisted of 36 tenth-grade students majoring in accounting. The research instruments included observation sheets for learning activities and questionnaires/tests for student learning outcomes. The data collection techniques used included observation and testing. Data analysis in this study was qualitative and quantitative. The final results based on learning activities and student learning outcomes showed that the average pre-test score was 58.33, with 10 students (27.80%) achieving mastery. The results of this study showed that in the first cycle exam, the average score increased to 70.27, with 22 students (61.11%) achieving mastery. In the second cycle exam, the average score rose to 89.75, with 34 students (94.44%) achieving mastery by meeting the success indicator of ≥80%. It can be concluded that the Think Pair Share learning model with the Gamification strategy can improve student learning activities and outcomes.

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Introduction

In the context of education, teachers play an important role and are always required to continuously improve the quality of their teaching (Amalia et al., 2022; Leu & Price-Rom, 2006; Bahr & Mellor). The teaching and learning process should be carried out in a fun way between teachers and students. A pleasant and harmonious relationship is essential in the learning process. However, in reality, learning activities are often monotonous, which in turn

causes boredom, according to information from interviews with teachers and students. This is due to a lack of communicative interaction between students and teachers, as well as among students themselves. As a result, students may feel bored during the learning process (Sihombing et al., 2022).

Therefore, the implementation of appropriate learning strategies by teachers is very important to support the improvement of the learning process of students, so that learning outcomes can be achieved optimally. According to Yandi et al. (2023), learning outcomes are the values achieved by students after receiving instruction during a certain period of time. Learning outcomes refer to the specific competencies or abilities acquired by students after participating in learning activities, encompassing effective, cognitive, and psychomotor aspects (Harris & Clayton, 2016; Gonçalves et al., 2016). To achieve good learning outcomes, students need to be actively involved in various learning activities that reflect their level of activity and engagement throughout the learning proses (Ananda & Hayati, 2020).Learning is a process of personality change in a person, where this change takes the form of improved behavioral quality, such as increased knowledge, skills, thinking ability, understanding, attitudes, and various other abilities (Djamaluddin & Wardana, 2019)

Learning activities are interactions between students and learning objects, which reflect their actual involvement during the learning process (Ananda & Hayati, 2020). According to Syafitri (2020), "learning activities are behavioral changes through interactions with the environment to achieve a goal."

Based on initial observations and information from one of the accounting teachers at Medan State Vocational School, it is known that student learning activities and learning outcomes are still relatively low. The low level of student learning activities is caused by (1) students not actively reading, paying attention, listening, or taking notes on important points from the material presented, (2) some students seem reluctant and shy to ask questions to their classmates or teachers when they have difficulty understanding the material being discussed, (3) some students choose to ignore the lesson by engaging in other activities, such as talking with friends or working on assignments for other subjects, (4) some students tend to be quiet or unresponsive and are afraid to express their opinions, (5) some students do not complete their assignments because they do not understand or are not interested in the material being discussed, (6) some students lack enthusiasm or motivation in learning due to difficulties in completing assignments. Learning outcomes are also suboptimal, as many students still have low daily test scores or fail to meet the Minimum Competency Criteria of 70, as set by school.

Accounting education in schools today still faces various challenges, particularly in improving student engagement and learning outcomes. In practice, teachers often rely on lecture-based methods, which tend to make students passive, as they only receive information without many opportunities for discussion (teacher-centered learning). As a result, students' learning outcomes are often low because they do not fully understand the material taught through this approach. Therefore, it would be better for teachers to choose more effective models and strategies to enhance student engagement and their learning outcomes.

According to Purnomo et al. (2022), a learning model is a conceptual design in the form of a systematic procedural pattern, developed based on a specific theory, and used to organize learning activities to achieve predetermined objectives. One learning model that can be used is the cooperative learning model, which emphasizes student activity and collaboration within a group (Elywati et al., 2014). One cooperative learning model that can be applied is the Think Pair Share model. According to Sumarsya & Ahmad (2020) think

pair share learning model gives students more time to think, which indirectly trains their critical and creative skills. The Think Pair Share model is a model that provides students with the opportunity to reflect on their thoughts before discussing them with their partners (Tanjung et al., 2025). After that, they can present the results of their discussion to their classmates in front of the class. With this approach, students can learn independently while collaborating with others (Lasari et al., 2021). In line with the opinion of Kurniawan et al., (2023) which states that the Think Pair Share cooperative model is a teaching approach in which students are encouraged to think critically and engage with challenging or basic material so that they can discuss it. Based on these opinions, it can be concluded that the Think Pair Share learning model is a cooperative learning model designed to enhance interaction among students and facilitate active learning.

Learning strategies are tools or a set of tools that teachers can use to deliver learning materials with the aim of making it easier for students to understand (Anggraeni & Nurhidayah, 2024). The selection of learning strategies must be appropriate and in line with the abilities of the students. There are various strategies that can be applied, one of which is gamification. The term "gamification" was first introduced by Nick Pelling in 2002 during a presentation he gave at the TED (Technology, Entertainment, Design) conference (Lia Sofia et al., 2023). Gamification is a learning process that uses elements found in games or video games with the aim of motivating students in the learning process and maximizing their enjoyment and engagement in the learning process in question (Jusuf, 2016). Gamification is a learning strategy that combines game design, game mechanics, and game thinking with learning objectives in the learning process (Febryana & Zubaidah, 2022). According to Prambayun et al. (2016) Gamification is a learning model that contains elements of play, where in its implementation it involves students solving problems through stages and interacting with each other, so that there can be encouragement in students to solve problems and at the same time trigger a sense of enthusiasm to find out what is still being learned and is not yet understood (Putri et al., 2023).

The combination of the Think Pair Share (TPS) model and gamification strategies is expected to create a more interactive and enjoyable learning atmosphere. Students are not only actively thinking and discussing, but also motivated to learn through the application of game elements. Ultimately, this is expected to increase student activity and learning outcomes in basic accounting courses, especially in material related to commercial company financial statements. In addition, gamification can help students better understand and remember accounting concepts in a more enjoyable and interactive way (de Oliveira Durso et al., 2019).

By integrating gamification into the TPS model, game elements such as challenges, quizzes, points, and rewards can be applied at every stage of learning. For example, in the thinking stage, students can be given challenges to find solutions or creative ideas related to the material being studied. When discussing with partners, students can earn points based on how well they collaborate and explain their ideas, as well as how quickly they correctly answer questions given by the teacher. In the sharing stage, groups that successfully convey information in an interesting and informative way can receive rewards from the teacher.

Gamification strategies not only create a more dynamic learning atmosphere, but can also increase motivation, promote learning, and help students solve problems (Jusuf, 2016). When students feel involved in the game and receive rewards, they tend to participate more actively in discussions and exploration of the material.

Method

This research was conducted at one of the Accounting Vocational High Schools in Medan, North Sumatra, Indonesia. This research was conducted in the even semester of the 2024/2025 academic year. This study is classroom action research (CAR) to observe student activities and their learning outcomes in basic accounting. Classroom action research (CAR) consists of two cycles, each cycle consisting of two meetings. If the first cycle is unsuccessful, it will be continued in the second cycle, and information from the first cycle greatly influences the second cycle. In this classroom action research, the researcher followed the PTK cycle model by Kemmis and Taggart, which consists of four stages in each cycle: (1) Planning, (2) Implementation, (3) Observation, and (4) Reflection, which is described as follows:

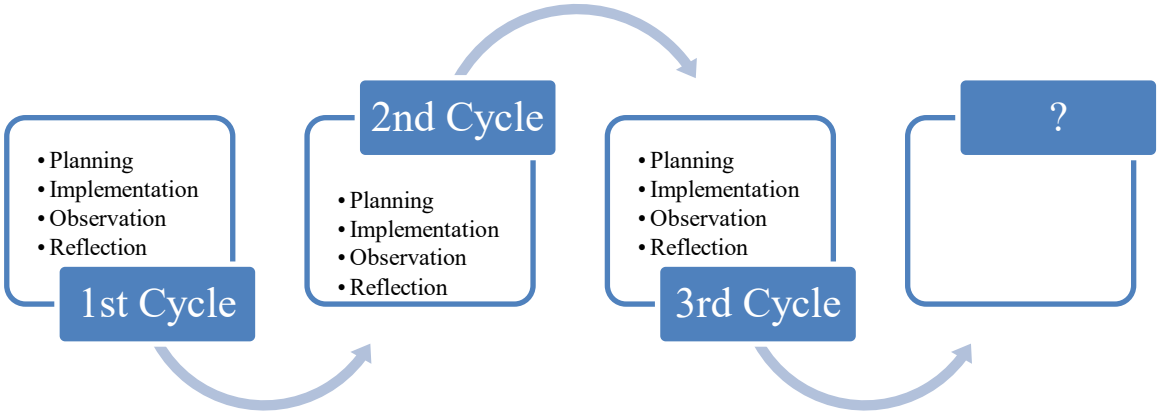

Figure 1. Classroom Action Research Cycle

In this study, there were two data collection techniques used, namely tests (pre-test, post-test 1, and post-test 2) and observation sheets filled out by observers. The test format used in the pre-test and post-test cycle 1 was multiple choice with 10 questions about financial statement concepts. Meanwhile, the test format used in the post-test cycle 2 was essay questions with 3 questions about preparing financial statements. This study used two approaches in data analysis, namely quantitative and qualitative.

Quantitative data was used to test hypotheses 1 and 2. Hypothesis 1 was tested to determine whether there was an increase in student learning activity after implementing the Think Pair Share learning model combined with the Gamification strategy, by comparing the level of learning activity in cycle 1 and cycle 2. If the learning activity in cycle 2 was higher than that in cycle 1, then there was an increase in learning activity, and the hypothesis was accepted.

Based on the results of the student learning activity observation sheet, an analysis was conducted to calculate the percentage of student learning activity levels during the learning process. The observation was conducted on 36 students, consisting of 3 males and 33 females. Several things were used, namely determining the individual abilities of students in each cycle and calculating the percentage of classical learning completeness.

Qualitative data is narrative information in the form of sentences that describe student expressions related to their level of success in basic accounting courses, including aspects of knowledge (cognitive), attitudes (effective), and learning activities which can then be analyzed. This analysis process will be conducted by comparing the level of student learning activity between cycles 1 and 2 using an observation sheet with a scale of very active, active, fairly active, less active, and inactive. If the observation results show that student learning

activities in cycle 2 are higher than cycle 1, it can be concluded that there has been an increase in student learning activities. Therefore, the hypothesis in this study is accepted.

Results and Discussion

In looking at student learning activities, the data collection instrument uses an observation sheet consisting of 7 indicators, namely: visual activities, oral activities, listening activities, writing activities, motor activities, mental activities, and emotional activities. Each indicator is assessed with a score of 1-4 then all scores obtained by each student are summed up to determine whether the student is included in the active and very active categories.

A learning activity can be considered successful or effective if 80% of students achieve the established learning objectives with a score that meets the Completion Criteria, namely 70 or higher (Hamalik, 2019). In the context of CAR, the actions implemented by researchers/teachers aim to create this optimal condition. Therefore, a minimum success target of 80% is set as a benchmark that the applied method or strategy has been effective in facilitating mastery of the material for the majority of students in the class (Akpan, 2020)

Table 1. Observation Results of Student Learning Activities Cycle 1 and Cycle 2

Student Learning Activity Category	Cycle 1		Cycle 2	
	Number of Students	%	Number of Students	%
Number of Active Students	**17**	**47,22%**	**31**	**86,11%**
Very Active	4	11,11%	13	36,11%
Active	13	36,11%	18	50%
Number of Inactive Students	**19**	**52,78%**	**5**	**13,89%**
Quite Active	12	33,33%	4	11,11%
Less Active	6	16,67%	1	2,78%
Not Active	1	2,78%	0	0

Based on table 1 above, in cycle 1, the target to be achieved was at least 80% or as many as 29 students scored ≥ 19. However, only 17 students (47.22%) met these criteria, with details: 4 students (11.11%) were in the very active category, and 13 students (36.11%) were in the active category. Meanwhile, 19 students (52.78%) had not reached the target, consisting of 12 students (33.33%) classified as moderately active, 6 students (16.67%) less active, and 1 student (2.78%) inactive.

Whereas in cycle 2, student learning activities showed an increase that met the success indicators. A total of 31 students (86.11%) managed to get a score ≥ 19, with a distribution: 13 students (36.11%) were very active, 18 students (50%) were active, 4 students (11.11%) were moderately active and 1 student (2.78%) was less active. To see the increase in student learning activities from cycle 1 to cycle 2 can be seen in table 1 below:

The increase in learning activities is depicted in the form of a bar chart; it will appear in Figure 2 below:

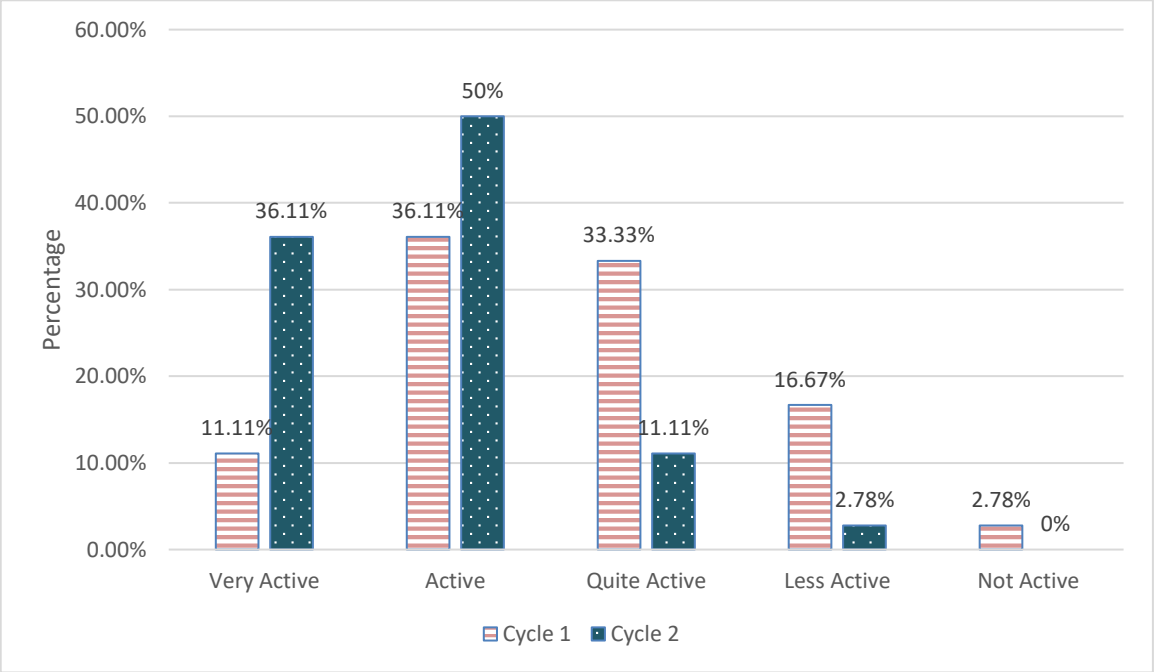

Figure 2. Student Learning Activity Improvement Diagram

Data on student learning activities were obtained through observation sheets, then analyzed to calculate the percentage level of student activeness during the learning process.

Based on the calculation of the percentage of student activity in cycle 1, active learning activity was recorded at 47.22%. This figure is still below the minimum standard of 80%, so observation of student learning activities continued into cycle 2.

In cycle 2, there has been an increase in student learning activities by 43.89%. The percentage of active learning activities became 86.11%, which means that it has met the criteria for completeness, which is at least 80% of the total 36 students. Thus, student learning activities in cycle 2 were declared complete, and there was no need for the next cycle.

In this study, the achievement of student learning outcomes was obtained through the implementation of pre-test and post-test in each cycle. Both types of tests are used to measure the extent to which students master the material about the financial statements of trading companies. The post-test in cycle 1 aims to determine the increase in learning outcomes after the implementation of the Think Pair Share learning model with the Gamification strategy. While the post-test in cycle 2 was intended to further determine the improvement in student learning outcomes compared to cycle 1, after the Think Pair Share learning model with the Gamification strategy continued to be applied.

Table 2. Student Learning Outcomes Before and After Action

Test Type	Average Value	Complete		Incomplete	
		Number of Students	%	Number of Students	%
Pre-test	57,77	10	27,78%	26	72,22%
Post-test 1	70,27	22	61,11%	14	38,89%
Post test 2	89,75	34	94,44%	2	5,56%

Based on the data in table 2, it is known that at the time of the pre-test only 10 students (27.78%) achieved learning completeness, while 26 students (72.22%) did not complete, with an average score of 57.77. The results of this pre-test reflect the initial ability of students before being given action. Then, in the first cycle post-test there was an increase in the

number of students who were complete to 22 students (61.11%), while students who were not complete decreased to 14 students (38.89%) with an average score of 70.27. Although there was an increase from the pre-test to the post-test of cycle 1, these results had met the predetermined success indicators. Therefore, the learning action was continued to cycle 2.

In cycle 2, the number of students who achieved mastery increased to 34 students (94.44%) with an average score of 89.75. Classical learning completeness in this cycle has met the categorized success indicator, which is at least 80% of students obtained a score of ≥70 in accordance with the Minimum Completion Criteria applicable at school.

For more details, the improvement in student learning outcomes can be seen in Figure 3 below:

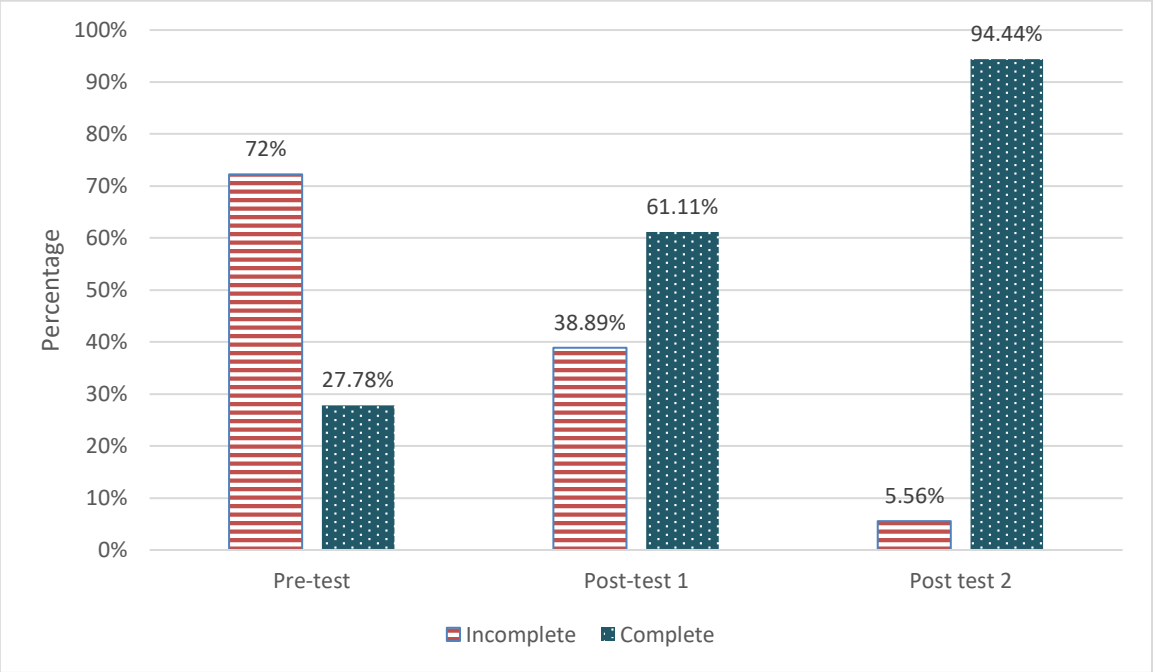

Figure 3. Diagram of Improvement in Student Learning Outcomes

To determine the percentage of learning achievement for each student, first calculate the learning achievement of each student. For example, to calculate the percentage of learning achievement for student A who scored 90 on post-test 1, divide the score obtained by the maximum score and then multiply by 100%, meaning 90 divided by 100 multiplied by 100% equals 90%. Therefore, the percentage achieved by Student A in cycle 1 is 90%. For other students, the calculation can be done in the same way or using the same formula.

Calculating Student Average Scores: The class average score is obtained by dividing the total score of all students by the number of students. From the results of the analysis, it can be seen that the average class score has increased in each cycle. Before the action was taken, the class average score was 58.33. After the implementation of cycle 1, the value rose to 70.27, an increase of 11.94. Furthermore, in cycle 2, the average score again increased to 89.75 with a difference of 19.48 from the previous cycle.

Classical completeness is obtained by sharing the total number of students who are complete with the total number of students which is then multiplied by 100%. The success standard set for the completeness of student learning outcomes is 80%. Based on the results of data calculation, it can be seen that the percentage of classical completeness shows a significant increase in each cycle. Before the action was taken, the level of classical

completeness only reached 27.78%. After the implementation of cycle 1, the figure rose to 61.11%, and in cycle 2 it increased again to 94.44%.

From the results of the researcher's observations and the data obtained through the observation sheet, it was seen that there was an increase in student learning activities from cycle 1 to cycle 2 after the implementation of the Think Pair Share (TPS) learning model combined with the Gamification strategy, with the following description:

Visual Activities. In cycle 1, some students still lacked focus in listening to the teacher's explanation and were not fully involved actively; when asked by the teacher about the content of the material, some students could not answer, when there were groups presenting, there were some students who did not fully pay attention when their friends made presentations. In cycle 2, the teacher made improvements to increase students' learning activities based on the weaknesses found in the first cycle. The teacher delivered the material with a clear voice emphasis, and while motivating students to be more enthusiastic, the teacher went around the class to see the students' focus and so that all students paid attention to their friends during the presentation. As a result, when the teacher explains, almost all students focus and pay close attention, some students dare to give answers if asked by the teacher because they have paid attention to the teacher's explanation well, during the presentation stage, almost all students pay attention to their friends during presentations and discussions. Furthermore, Sartika et al. (2022) stated that students carry out learning activities because there is something that encourages them. In this case motivation is the basic driving force that encourages students to learn.

Oral Activities. In cycle 1, some students still experienced obstacles in expressing opinions or asking questions clearly and confidently during class discussions, some students felt that they had not mastered the material or topic being discussed, so they were reluctant to express their opinions or questions. Sartika et al. (2022) said that the teacher's job is to coordinate the environment to support behavior change for students. Therefore, in cycle 2 the teacher made improvements, namely the teacher created a friendly learning atmosphere and, giving praise to students who dared to speak even though the answer was not entirely correct, the teacher provided many opportunities for students who asked questions and gave opinions during the Share stage to compete for points. The teacher rotated student groups by pairing active students with less active students. As a result, learning in cycle 2 showed considerable improvement. Almost all students felt more comfortable and open to speaking because they were not afraid of being judged by the teacher or their peers, students who received praise felt valued and became more frequent in expressing their opinions, many students became more active. According to the opinion of Immanuella et al. (2023), stating that an active, fun, and interactive classroom atmosphere is very important to encourage students to dare to speak, express opinions, ask questions, and answer questions. Teachers who master questioning techniques and use the right question and answer method can facilitate students to be more verbally active in the learning process.

Listening Activities. In cycle 1, some students were easily distracted, such as chatting with friends or noise from outside the classroom, some students were seen playing with their stationery or daydreaming when the teacher, and there were also students who did not pay attention to the explanation seriously or fully concentrated. Therefore, in cycle 2 the teacher has made several improvements, namely the teacher keeps the classroom conditions conducive so that students can listen well, the teacher also walks towards students both sitting at the back, middle and front to prevent students from chatting, after the material is delivered, the teacher gives students the opportunity to ask questions or respond. As a result, the learning process in cycle 2 showed considerable improvement, all students seemed more

focused and were not distracted by things such as chatting with friends, most students were actively involved in learning by asking questions or giving in-depth opinions. This is in line with the opinion of Sukirman & Dewi (2021), which states that teachers must be able to create a conducive classroom atmosphere or climate to support the quality of the learning process. Creating an effective learning environment can be done through several things, namely effective classroom management, effective classroom activities, and management of problematic behavior.

Writing Activities. In cycle 1, not all students were able to take neat and structured notes, some students were also seen taking notes in a hurry or were not used to taking notes coherently. Therefore, in cycle 2 the teacher made improvements by going to all students' desks to check the notes or assignments they were doing, the teacher also gave additional time so that students could complete notes or assignments neatly and easily understood. As a result, most students have been able to make neat, structured, and easy-to-read notes, student notes use clear language and good sentence structure.

Motor Activities. In cycle 1, students still had difficulty completing questions about the concept of commercial company financial statements quickly and accurately because they were still confused in finding the answers or did not yet understand the material well. In cycle 2, the teacher made improvements. During the pairing stage, the teacher gave 10 groups that had successfully completed the questions quickly and correctly the opportunity to earn points as part of the gamification strategy. This encouraged students to compete in completing the questions quickly and accurately. Ultimately, the learning activities in Cycle 2 showed a significant improvement. Most students could solve financial statement problems more quickly than before, indicating an improvement in understanding and problem-solving skills. In line with Siregar (2021), who stated that when students frequently solve problems, especially those that are challenging and stimulate critical thinking, it can train them to become accustomed to analyzing problems and finding appropriate solutions.

Mental Activities. In cycle 1, some students still had difficulty working on questions about commercial company financial statements. Several students appeared confused about determining the components of commercial company financial statements and the form or format for preparing commercial company financial statements. To address this issue, in Cycle 2, the teacher implemented several improvement measures, including actively guiding the groups. This approach allowed students to receive direct guidance when asking questions, sharing opinions, and receiving feedback to improve their work. Additionally, the teacher moved around to each group and offered assistance when needed, ensuring all students received proper guidance. Ultimately, all students began to be able to explain the components present in various types of financial statements for trading companies. Nearly all students were able to prepare financial statements for trading companies correctly. (Wahab & Rosnawati, 2021) states that learning requires consistent and sustained practice. Repeatedly working on problems helps students better understand the material and achieve good results.

Emotional Activities. In Cycle 1, there were several students who appeared less enthusiastic or less happy during lessons. Some students seemed to have difficulty managing their emotions and stress during the learning process. Some students also felt afraid or lacked confidence when the teacher asked them to present the results of their discussions in front of the class. Therefore, in cycle 2, the teacher began to approach all students and provide guidance on the importance of self-control when facing difficult situations, especially when students felt panicked. Finally, learning in Cycle 2 showed significant improvement, with

most students appearing calmer and able to concentrate when doing assignments or taking exams, resulting in better performance. Most students were also enthusiastic about presenting their discussion results in front of the class. This aligns with the opinion of Riza & Yoto (2023) who explain that emotional intelligence is closely related to academic achievement because it helps students manage their emotions, think critically, and adapt to learning pressures. Furthermore, students with emotional intelligence tend to understand material more easily, communicate effectively, and build positive relationships during the learning process. Therefore, emotional intelligence is a crucial factor supporting students' success in mastering the material presented by teachers.

Conclusion

The application of the Think Pair Share (TPS) model with a gamification strategy has proven effective in increasing student learning activities and learning outcomes in the subject of financial statements of trading companies at one of the vocational accounting schools. This can be seen from the improvement in the number of active students in learning process by cycle 1 to cycle 2. The level of classical completeness improves at the end of the action, by a minimum completeness criterion of 70. For future researchers, it is recommended to apply the Think Pair Share model with Gamification strategy at different grade levels, as well as at other vocational schools. The aim is to expand the scope of generalization of the effectiveness of this model in improving student learning activities and outcomes.

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