Experimentation of Cooperative Learning Model STAD-TGT Type against Students’ Learning Results

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Abstract. This quasi-experimental research aims to know the differences in student learning results from using various learning strategies: STAD, TGT, STAD combined with TGT, and conventional learning. This study used control group design posttest only. The population of this research is all students of class VII SMP in Makassar even semester of academic year 2016/2017. The sample was determined by employing simple random sampling technique which is preceded by testing their equality using grouping test. The hypothesis of the study was tested using ANOVA Test. The result of the data analysis shows that there are differences in learning outcomes between classes taught by STAD only, TGT only, and STAD combined with TGT. This suggests that learning strategies affect the learning outcomes. Further test results (Turkey HSD), shows the learning strategy STAD, TGT, and STAD combined with TGT has significant differences from the results of conventional learning. The students’ achievement who taught with STAD approach had a significant difference with students who were treated with STAD combined with TGT. However, learning outcomes of students studying using STAD strategies have no significant differences with learning outcomes using STAD combined TGT.

1. Introduction
Essentially, physical education subject is an educational process that utilizes various physical activities to produce a holistic change in the quality of the individual, not only in physical, but also in mental, and emotional terms. Husdarta [1] states that this subject is an educational process through activities related to selected physical, game, or sport to achieve some particular educational goals.

The components involved in the teaching and learning process of physical education subjects (objectives, materials, methods, and evaluation) are linked to each other and cannot be separated from one another [2]. Learning activity is one form of processes in improving the quality of thinking. Unfortunately, until nowadays, most of the learning methods are still focusing on the transfer of science, not the formation of science [3,4,5].

It is generally believed that applying the effective teaching approaches can help the teachers to support students achieving learning objectives. Joyce et al. [6] stated that applying some learning models can help learners to gain information, ideas, skills, values, thinking skills, and ability to express themselves. There are several methods and models of learning that have been successful in providing innovation in the learning process. However, since physical education subject has its own characteristics, those methods need to be analyzed before being applied in physical education teaching.
In its essence, the most important long-term outcome of instruction lies in how students are able to improve their capabilities to learn more easily and more efficiently in their future, because of the knowledge and skills they have acquired as well as the mastery of a better learning process.

In order for students to be active, creative, and innovative in response to every lesson taught, creative and innovative teachers are needed. Johnson et al. [7] mention several approaches that can be done in the classroom, namely: (1) Competition, which involves students in a fight that can determine who wins and who loses; (2) Individualism, which asks students to work independently of a particular assigned tasks and strive alone to achieve the learning goals; and (3) Cooperation, which is to work together in a group and each member of the group is ensure to contribute and understand the task being done. One effort that can be done is this latest one.

Cooperative learning is a teaching strategy that involves students working in collaboration to achieve common goals. There have been many studies [8,9] proving that cooperative learning could improve the quality of the learning process. Awofala et al [9] indicated that there is a significant difference in achievement between cooperative learning and individual learning. Furthermore, Johnson et al. [7] even state that through a collaborative learning, students will get results that are not only useful for themselves, but also for others, and even the results achieved will be much better than the results achieved if working alone.

Cooperative learning has many variants, two of them are Student Teams Achievement Divisions (STAD) and Teams Games Tournament (TGT). STAD is one of the simplest cooperative learning model involving heterogeneous groups. There are several steps that have been put forward by Slavin [10], they are :1) doing class presentation; 2) creating some teams; 3) giving quiz; 4) recording the individual progress scores, and 5) giving group awards. Group formation will assist teachers to create a better classroom atmosphere that can stimulate students' positive attitudes. The teacher just needs to give a quick explanation of the material in the beginning of the lesson, and the rest, the teacher, just acts as a mediator in the classroom.

Like STAD, the TGT learning model is one of the learning models where students are placed in teams with mixed ability to compete in a game. Slavin [10] states that TGT consists of three regular cycles in teaching activities, as follows: 1) Teaching; teachers deliver lessons; 2) Learning teams: for example, students work on activity sheets in their respective teams; 3) Tournaments: students play academic games in homogeneous abilities at each tournament table; and 4) Team recognition: Team scores are calculated based on team members' tournament scores. The team will be recognized if they are able to exceed the predefined criteria.

In general, TGT is the same as STAD except in one respect: TGT uses an Academic Tournament and uses quizzes to determine individual progress scores. This is done by asking each team to send a representative for the race. For activities to be more effective, group representation is paired with representatives of other groups deemed to have the same or equivalent academic performance. The use of TGT is very often collaborated with STAD. This is implemented by adding certain tournaments to the regular STAD structure [10]. In TGT, learners play games with other team members to get scores for their respective teams. Games can be arranged in the form of quizzes or in the form of questions relating to the subject matter. In this model, students play the game with other team members to earn additional points for their team [11].

The application of this method has been proven to have a significant effect on the learning outcomes of football in a study conducted by Abdillah et al. [12]. Furthermore, Veloo and Chairhany [13] found that such teaching methods did not only improve the learning outcomes, but also enhanced the student attitudes. This was because the teaching methods stimulated students to solve problems through discussion activities both among students and between teachers and students. The results of the research conducted by Erviani [14], Etyaningsih [15] and Iwit [16] recommended the use of STAD / TGT to complement the teaching of physical education at the secondary school level since the students in that age (teenagers) seemed more qualified to be gained in discussion and more independents settings as applied in this approach.
The purpose of this current research is to know whether there are differences in student learning outcomes in the class that is taught by STAD type cooperative learning model combined with TGT, STAD, TGT, and conventional learning or not.

2. METHOD

This research used the quantitative approach with quasi-experiment to evaluate either one variable affects another variable [17,18]. The independent variable in this research was the learning model, that was STAD, TGT, STAD-TGT and conventional learning. The dependent variable was the student learning outcomes. The design of this study used control group posttest-only [18].

Considering the finding of the research conducted by Erviani [14], Etyaningsih [15] and Iwit [16] as mentioned earlier, the subject of this research was the junior high school students. The population was the all students of class VII SMP in Makassar, the even semester of academic year 2016/2017. The research sample was determined by employing simple random sampling technique which was preceded with equality test using grouping test.

The research data were obtained by giving the test after treatment (posttest). The normality and the homogeneity of thos data then was tested. Furthermore, the hypothesis of this study was tested by using variance analysis (ANOVA) which is assisted with SPSS 22.0 for Windows software.

3. Results and Discussion

3.1. Data of Learning Result Based on Post-Test

Here are the measurement data of students’ final learning outcomes. Table 1 contains a summary of the measurement data of students' final learning outcomes. Data were obtained from post-test results in experimental class (STAD, TGT, STAD-TGT) and control class (conventional).

|       | N  | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | Minimum | Maximum |
|-------|----|------|----------------|------------|---------------------------------|---------|---------|
| STAD  | 25 | 81.80| 6.01           | 1.20       | 79.32 - 84.28                   | 70.00   | 88.00   |
| TGT   | 25 | 77.96| 4.10           | .82        | 76.27 - 79.65                   | 68.00   | 84.00   |
| STAD-TGT | 25 | 83.08| 3.28           | .66        | 81.73 - 84.43                   | 75.00   | 88.00   |
| konvensional | 25 | 74.60| 3.66           | .73        | 73.09 - 76.11                   | 66.00   | 80.00   |
| Total | 100| 79.36| 5.47           | .55        | 78.27 - 80.45                   | 66.00   | 88.00   |

To make it easier to understand, the data of student learning results from the experimental class and the control class are presented in the following bar charts.

![Figure 1. Learning Result](image-url)
From the chart above, it can be identified that the highest learning result was obtained by students who were taught by the combination of STAD and TGT methods (83.08), while the lowest one was the study achievement of students in class that were taught by Conventional method (74.6). The average of final learning outcomes in the class that was taught with TGT learning strategy was 77.96. It is lower than the final learning outcomes in the class that was taught by STAD (81.8).

The data were then analyzed using ANOVA and the results are summarized in the following table.

### Table 2. ANOVA Test of Post-test

|                  | Sum of Squares | df | Mean Square | F         | Sig.  |
|------------------|----------------|----|-------------|-----------|-------|
| Between Groups   | 1110.240       | 3  | 370.080     | 19.196    | .000  |
| Within Groups    | 1850.800       | 96 | 19.279      |           |       |
| Total            | 2961.040       | 99 |             |           |       |

Based on the summary of ANOVA Test results in table above, the students' learning achievement significance score is obtained 0.000 or less than 0.05. This means the null hypothesis is rejected and the research hypothesis is accepted. That is, there are differences in the average learning outcomes between classes that are taught with STAD learning strategies, TGT, STAD combined TGT and conventional class. This clearly shows that learning approach affects student's learning outcomes.

### Table 3. Post-Hoc Test of Post-test

| (I) class | (J) class | Mean Differe nce (I-J) | Std. Error | Sig.  | 95% Confidence Interval Lower Bound | Upper Bound |
|-----------|-----------|------------------------|------------|-------|------------------------------------|-------------|
| STAD      | TGT       | 3.84*                  | 1.24       | .01   | .59                                | 7.09        |
| STAD      | konvensional | 7.20*                | 1.24       | .00   | 3.96                               | 10.45       |
| STAD      | STAD_TGT  | -3.84*                 | 1.24       | .01   | -7.09                              | -5.93       |
| TGT       | STAD_TGT  | -5.12*                 | 1.24       | .00   | -8.37                              | -1.87       |
| TGT       | konvensional | 3.36*                | 1.24       | .04   | 11                                 | 6.61        |
| STAD      | TGT       | 1.28                   | 1.24       | .73   | -1.97                              | 4.53        |
| STAD      | konvensional | 8.48*                | 1.24       | .00   | 5.23                               | 11.73       |
| STAD      | TGT       | -7.20*                 | 1.24       | .00   | -10.45                             | -3.95       |
| STAD      | konvensional | -3.36*             | 1.24       | .04   | -6.61                              | -1.11       |
| STAD_TGT  | TGT       | -8.48*                 | 1.24       | .00   | -11.73                             | -5.23       |

*The mean difference is significant at the 0.05 level.

Based on Post-Hoc Test results using the Turkey HSD test, the result of learning employing STAD, and STAD combined with TAD learning strategies differed significantly with the result of conventional learning approach. This suggests that the learning strategy in the experimental class is significantly different from the learning outcomes in the control class. Meanwhile, teaching with STAD or with STAD which is combined with TGT had a significant difference with teaching with TGT only.

### Table 4. Homogenous Subsets of Posttest Data

| Class       | N  | Subset for alpha = 0.05 |
|-------------|----|------------------------|
| Konvensional| 25 | 74.60                  |
| TGT         | 25 | 77.96                  |
| STAD        | 25 | 81.80                  |
| STAD_TGT    | 25 | 83.08                  |
| Sig.        | 1.00 | 1.00                  |


However, based on the results of a further tests using Turkey HSD, it was found that students’ learning result in the class using STAD learning strategies did not differ significantly with that of students using STAD strategy combined with TGT. This shows that TGT learning strategy does not give significant effect to the success of learning while STAD learning strategy has a strong impact on student learning outcomes.

3.2. Effect of Cooperative Learning Model Type STAD Combined TGT to Student Learning Achiement

The dialogue or discussion used in this method was conducted with four strategies: summarize, question, clarify, and predict problems. The results showed that STAD learning approach has a strong effect on students’ learning outcomes, either by using this strategy individually or by integrating it with TGT. The best learning outcomes are shown by the class with STAD learning strategy combined with TGT. Learning through the application of the STAD learning model (Student Team Achievement Division) can affect the learning outcomes of students’ physical education because the learning process focuses on the interaction or dialogue between students and students as well as dialogue between students and teachers, where each gets the opportunity to lead the discussion. This finding confirms the research result conducted by some researchers mentioned earlier, e.g. Awofala et al [9], Zakaria and Iksan [8], Awofala, et al. [9], Erviani [14], Etyaningsih [15] and Iwit [16].

Teaching is an attempt to create situations that allow the learning process to take place. This is in line with the opinions expressed by Fathurrohman and Sutikno [19] that teaching is an activity to organize or manage (control) the environment to create the best atmosphere and connect it with learners so that there is a fun learning process. During the treatment using this method, even though students became more active in the learning process, it does not mean the teacher has no role. In the learning model STAD (Student Team Achievement Division), teachers and students have the same responsibility in the success of teaching and learning process. Such principal was also employed in the group which was treated with such method. Thus, through the above teaching formulas, in addition to centering on students who study, teacher also saw the essence of instruction as a process; the process undertaken by teachers in fostering student learning activities.

One of the most important principles of educational psychology is that teachers are not merely giving knowledge to students. Indeed, the student must build knowledge in his own mind. It can be realized by providing an opportunity to students to find ideas and apply them consciously especially in learning activities.

Such ideas were possibly realized by the implementation of cooperative learning. Cooperative learning is different from other learning strategies. By employing that approach, learning can be seen from the learning process that emphasizes the process of cooperation in groups. Objectives to be achieved not only academic ability regarding mastery of subject matter but also elements of cooperation to master the material being studied.

The existence of collaboration is the hallmark of cooperative learning [20]. In essence, cooperative learning is the same as group work. Cooperative learning is a form of learning utilizing students learning and working in collaborative small groups whose members consist of four to six people with heterogeneous group structures. Therefore, this learning allows creating a wider interaction, i.e. the interaction between teachers and students, students with students, and students with teachers.

The advantages of STAD cooperative learning model, according to Slavin [10] are: (a) it is possible to improve the individual skills; (b) the group skills can be enhanced; (c) it is potential to stimulate the learners’ commitment; (d) it eliminates the students’ tendency to prejudice against peers; and (e) it avoids students from competitive environment. Despite those strengths, some disadvantages, that may occur are: (a) the contribution of underachieving students is less; (b) it potentially lead the high-achieving students to disappointment because they realize that the success achieved by their team represents the vast majority of their achievement. Cooperative learning team-games-tournaments method in this research is done by dividing the students into several teams whose members consist of 5 people with heterogeneous characteristics. Academic materials are presented to students in text
form, where each group has the same problem/material and each student is responsible for learning a part of the academic material. This makes the use of TGT able to cover the shortage of STAD. In this research, the most obvious positive impact identified are the increase of students individual and group skills. Learner’s commitment development and keeping students away from competition oriented have not been clearly studied in the current research. Also, those potential hazards have not been explicitly investigated.

In general, TGT and STAD have many similar characteristics. They are different in terms of one thing; TGT uses an academic tournament and uses quizzes and individual progress score systems, students compete as their team representatives with other team members of equal academic performance. Cognitive learning of type TGT is one type of cooperative learning involving all student activities without having any status difference, involving the role of the student as a peer tutor and containing an element of the game. Learning activities with games designed to enable students to learn more relaxed so as to foster responsibility, cooperation, healthy competition and learning involvement [16].

Putting students in some groups or teams is the approach which can be used by teachers to promote and develop social attitudes, the souls of sportsmanship, and the positive competition of students. Students who are accustomed to working in groups can be aware of their weakness and strengths, and they are able to develop positive competition in the class in achieving optimal performance. The game is a form of recreational activity that is set to achieve certain goals and to give pleasure to the players. The game has the following characteristics: (a) there is a set of explicit rules that every player should follow, (b) there are goals to be accomplished or tasks to be done, and (c) there are criteria that are regarded as the standard of the game. The tournament is an interesting lesson. It is a competition that can be used as a tool to motivate students to improve their learning achievement. Therefore, the type of game-used should have the following characteristics: (a) in line with the curriculum, (b) matched with the characteristics of the learner, and (c) considering the students circumstances and the school environment [21].

Based on the characteristics of the TGT learning, there are several weaknesses of the team method found, they are: (a) a more careful preparation is needed both by teachers and students; (b) The untrained teacher causes the learning objectives not to be achieved; (c) it requires a wider study space; (d) uncontrolled games potentially cause noise. However, during the treatment, the researchers successfully coped with those challenges, thus, a remarkable learning results were obtained.

4. Conclusions
Based on the results and data analysis, it was concluded that there were differences in learning outcomes between classes that were studied with STAD, TGT, STAD and TGT combined and conventional learning strategies. This suggests that learning strategies affect the learning outcomes. Further test results (Turkey HSD), showed the learning strategy STAD, TGT, and STAD combined TGT significantly different with conventional. STAD and STAD learning strategies combined with TGT differ significantly with TGT. In contrast, STAD learning strategies with STAD combined TGT were not significantly different. Overall, the STAD strategy combined with TGT showed better student learning outcomes than other learning strategies.

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