The Application of Crossword Puzzle in The Team Games Tournament (TGT) Learning Model to Improve Learning Motivation

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Abstract. The purpose of the study is to ascertain whether adding crossword puzzles to the Team Games Tournament (tgt) for class VII B SMPN 2 Halongonan Timur will improve student' motivation to learn. The benefit of this study is that the use of crossword puzzles in TGT can improve students' learning motivation. SMPN 2 HALONGONAN TIMUR, namely from February to June 2022, served as the site for this study. A one-group pretest-posttest pre-experimental design comprised the research methodology. The ARCS motivation questionnaire, which includes indicators for Attention, Relevance, Confidence, and Satisfaction, is the tool utilized for data collecting. Data on student motivation for learning were examined using descriptive analysis. The medium category has an average improvement in student learning motivation of 0.40. Thus, it can be inferred that the inclusion of crossword puzzles in TGT can improve the class VII B SMPN 2 HALONGONAN TIMUR students' motivation to learn.

Keywords: Crossword Puzzle, Team Games Tournament (TGT), Students Motivation.

1 Introduction

Education is an effort conducted by humans with the intentional and planned goal of realizing an effective learning process and educating students to reach their full potential [1]. The learning objective is to increase information in a way that helps develop students' cognitive skills, stimulates their interest, and motivates them [2-4]. Learning objectives are a description of the behavior that is expected to be achieved by students after the learning process. The learning objective for science subjects is one of the ones that should be accomplished.

The goal of junior high school science instruction is for students to comprehend numerous scientific concepts and principles in order to build information, abilities, and attitudes that may be used in the real world and as a preparation for further education [5]. In addition for science learning to be successful, there are seven principles that must be followed during the teaching and learning process, one of which is the motivational principle [6]. In line with that according to Robert M. Gagne in [7] motivation is the initial phase of starting learning with the urge to take an action in achieving certain goals. According to Djamarah [8] motivation is a shift in a person's energy that takes place and is described by the emergence of sentiments in order to trigger off a response to accomplish a particular objective.

A great motivation in science will make students to be ready to update all learning outcomes that have been previously owned [9]. Intrinsic elements, such as desire, the need to succeed, stimulation of learning requirements, and expectations of ideals, can spur motivation to learn. Meanwhile, extrinsic elements, include the availability of rewards, a supportive learning environment, and engaging learning activities. Both factors are brought on by specific stimuli, which make someone want to engage in more active and enthusiastic learning activities [10]. The degree to which learners' learning behavior is successful or unsuccessful is strongly determined by motivation [11]. In line with the understanding of learning motivation, it can be concluded that students' motivation is crucial to the learning process and the achievement of learning goals.

Students in class VII at SMPN 2 HALONGONAN TIMUR were observed by researchers, and it is evident that they do not actively participate in the teaching and learning process, such as not paying attention when the teacher explains science lessons in class, lack of enthusiasm when the lesson is taking place, and lack of discussion activities related to science learning materials. Researchers also conducted interviews with science teachers who taught in class VII stated that after the pandemic and face-to-face learning took place, many students were less enthusiastic and unfocused during the learning process and did not understand the material. This problem is similar to the research that has been done [12] new habits obtained during online learning, such as not listening to the learning delivered because of boredom in learning, educators also found students unpreparedness in online learning, namely many materials that could not be understood properly.

Science learning at SMPN 2 HALONGONAN TIMUR is still dominated by using the lecture method, learning only takes place one way and makes students tend to be passive, lack of curiosity of students in learning, and do not dare to express opinions or questions. This is in line with the research that has been carried out by [13] states that teaching using the lecture method often experiences problems, especially related to its monotonous nature and makes students feel bored so as to make students' learning motivation low. The symptoms above most definitely demonstrate that students lack the urge to properly participate in the learning process and lack of enthusiasm for academic achievement, which indicates low levels of learning motivation.

Decreased learning motivation can cause students to be not optimal in obtaining learning outcomes [14]. A stimulant is necessary for students' learning motivation to increase, and a creative teacher is one such stimulant [15]. In science lessons, a creative teacher must be capable of improving students' willingness to learn, especially in physics materials by using learning strategies that can help students be active and enthusiastic in learning physics. A teacher must be able to combine learning models, combining methods and engaging material into the teaching and learning process to improve active learning. accordance with the research that has been carried out by [16], implementing the learning paradigm of team games tournament (tgt) causes students who are typically passive to become more active. In line with the research that has been carried out by [17], employing the team games tournament learning paradigm can improve students' motivation to learn.

Using a grouping structure or small teams, the TGT learning model is a form of cooperative learning, which is four to six people who have different academic backgrounds, genders, races, or ethnicities. The five stages of team games tournament type cooperative learning include the class presentation stage, learning in groups, games, tournaments, and team recognition [18]. In Pongkendek research [19] stated that the tgt learning model can foster learning motivation, this is because students feel happy when learning they are involved, both in class presentations, group discussions, and games carried out, so that each student in each group competes to earn

the highest points in competitions that test their skills, with the value of the competition indicating the group's success.

The variety of techniques and media can't really be separated from the learning process when using the tgt learning model. In Khaerunnisa research [20] learning media have an impact on students' motivation to learn. One of the game methods with interesting and fun media is crossword puzzles, which is a game of filling in empty columns starting with questions horizontally and decreasingly [21-24]. Research [25] also mentioned that the interaction of learners with their peers through games has given rise to the confidence of learners to complete the entire learning. Crossword puzzles function to wake up the nerves of the brain which gives the effect of refreshing memory so that the brain's work function returns to optimal because the brain is accustomed to continue learning casually [26].

The findings of Burhanuddin's research provide evidence for this [27] in his research stated that the application of crossword puzzles can provide solutions to students' learning motivation. Crossword puzzles are extremely creative and captivating, involving pupils actively in the learning process. In addition, crossword puzzles can hone students' memories of the material that has been taught. Further research Agustin [28] according to his research, this crossword puzzle is particularly beneficial since it can improve students' engagement, creativity, and activity through interactions with both teachers and other students as well as with one another. Based on the description above, researchers feel interested in conducting research with the title "The Application Of Crossword Puzzle In The Team Games Tournament (TGT) Learning Model To Improve Learning Motivation".

2 Methods

This research was conducted at SMPN 2 HALONGONAN TIMUR in the even semester of the 2021/2022 academic year. The research time is in February-June 2022. The study's participants were students in class VII B, totaling up to twenty-five individuals, with twelve male and thirteen female participants.

One Group Pretest-Posttest Design is the pre-experimental methodology used in this research [29]. Prior to starting the subject's treatment, an initial motivation questionnaire was given in the form of Pretest (O_1) then treatment (X) was carried out and after that a final motivation questionnaire was given in the form of Posttest (O_2). Because the pretest allows for

$$\boxed{O_1 \qquad\qquad X \qquad\qquad O_2}$$
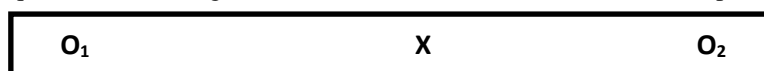
comparison with the pre-treatment state, the results of the therapy may be predicted more precisely. Figure 1 illustrates the One Group Pretest-Posttest design:

Fig. 1. One Group Pretest-Posttest Design

Information:
O_1 : Pretest
X : Treatment (TGT learning model with crossword puzzle)
O_2 : Posttest

Learning motivation using Keller's ARCS model was surveyed using the data collecting instrument in this study, a model that is often used to measure student motivation in terms of attention, relevance, confidence, and satisfaction [30]. The questionnaire used in this researcher is an adoption questionnaire that has been tested for validity and rehabilitation by Umi Mahmudah [31] when conducting research. Of the 36 statements, 25 valid statements were obtained. Furthermore, the statement's points are updated by identifying the statement's components in team games tournament (tgt) learning by applying crossword puzzles.

Data analysis techniques in this study were carried out using descriptive analysis. Descriptive analysis was used to analyze data on students' learning motivation before and after being treated using motivational questionnaires. According to Zulhelmi [32] the distribution of learning motivation scores is set up using a likert scale, as shown in Table 1.

Table 1. Categories Student Learning Motivation

Average Motivation Score	Score Categories
1.0 - ≤ 1.75	Very Low
≥ 1.75 - < 2.5	Low
≥ 2.5 - < 3.25	High
≥ 3.25 – 4.0	Very High

Source: Zulhelmi

The average pretest and posttest scores indicate that students' learning motivation on learning science physics can be analyzed by gain. To analyze the gain used Hake (in Meltzer) formula [33]. The average value of pretest and posttest is obtained, where:

$$\text{Gain} = \frac{\text{Score Posttest} - \text{Score Pretest}}{\text{Score Maximum} - \text{Score Pretest}} \tag{1}$$

The criteria for achieving student motivation are categorized as follows:

Table 2. Criteria for Achieving Student Learning Motivation

Interval	Category
G > 0.7	High
0,7 > G > 0.3	Medium
G < 0.3	Low

Source : Hake (in Meltzer)

As a result of treatment or the other way around, if student learning motivation increases, student learning motivation gains also improve. The gain analysis comparison between the initial learning motivation score and the final learning motivation score can be used to derive conclusions (increase). If the score obtained by G > 0.3, it may be said that scientific students are more motivated to learn physics.

3 Result and Discussion

This study has completed the stages of research that were previously conducted by other researchers using the arcs motivational questionnaires, including distributing the initial questionnaires to gather the preliminary motivational data (pretest), administering the treatment (treatment) using crossword puzzles in learning time games competitions (tgt), and distributing the questionnaires to gather the concluding motivational data following the treatment (posttest). In this study, the gain value was used to determine how much student learning motivation had increased. According to the research's findings, Table 3 displays the class VII B students at SMPN 2 HALONGONAN TIMUR's beginning and final motivating score categories.

Table 3. Class VII B of SMPN 2 HALONGONAN TIMUR Students' Learning Motivation

Indicators	Pretest		Posttest		Gain	Category
	Score	Category	Score	Category		
Attention	2,39	Low	2,98	High	0,37	Medium
Relevance	2,41	Low	2,97	High	0,35	Medium
Confidence	2,42	Low	3,07	High	0,41	Medium
Satisfaction	2,43	Low	3,15	High	0,46	Medium
Average value	**2,41**	**Low**	**3,04**	**High**	**0,40**	**Medium**

According to Table 3, it is clear that the use of crossword puzzles in the learning time games tournament (tgt) helped students at SMPN 2 Halongonan Timur move from low to high categories in their learning motivation scores for the solar system material class VII B. With regard to the overall indicators of student learning motivation, the initial score was an average of 2.41 for the low category, while the final score was an average of 3.04 for the high category. The satisfaction indicator, which has a score of 0.46 and falls into the medium group, represents the greatest improvement (gain) in students' learning motivation. The average score for the rise (gain) of students' learning motivation is 0.40, which is included in the medium category. The increase score (gain) on the indicators of attention, relevance, and confidence are 0.37, 0.35, and 0.41 respectively in the medium category.

Attention. After learning with the application of crossword puzzles in learning time games tournaments (tgt) on solar system materials, students' learning motivation on attention indicators has increased. The average initial score for the indicator of attention to student learning motivation was 2.39, and the average final score for the indicator on student learning motivation was 2.98, as can be seen from the gain value obtained from the average score for 8 points of statements, which is 0.37 in the medium category. The use of crossword puzzles in learning time games tournaments (tgt) has been shown to raise attention indicators by motivating students to learn about the solar system by watching instructional videos, completing LKPD, and solving provided crossword puzzles. This is in line with Suciati and Irawan [34] states that students' attention arises driven by curiosity that can be stimulated or triggered through new, strange, and different elements with existing ones so that students' attention is maintained during learning.

Relevance. According to the study's findings for the relevance indicator relevance class VII B SMPN 2 HALONGONAN TIMUR, the initial motivation score was 2.41 in the low category and the final motivation score was 2.97 in the high category, as can be seen from the gain value of 0.35 in the medium category that was found using the average score for 4 statements. Because there are questions in crossword puzzle games that are relevant to daily life, students can learn about the ideas of physics in daily life by using crossword puzzles to the learning time games tournament (tgt) on solar system material. In accordance with this, Gagne and Berliner found that students will be more motivated to learn if the learning content in learning activities is connected to something that has already been studied. Students will perceive the connection between the learning they encounter and their personal experiences with such a technique [35]. The relevance indicator, however, actually had the least gain in score among the four incentive indicators when compared to the others. Tuti Alawiyah [36] says that this is possible because some pupils continue to fail to grasp the connection between the material being taught and their everyday lives.

Confidence. According to the study's findings, the average score of student learning motivation in class VII B at SMPN 2 HALONGONAN TIMUR grew from 2.42 to 3.07 in the category of low to high, with the gain value gained from the average score for 6 statements was 0.41 in the medium category. Due to the fact that students must participate actively in the learning process, one of which includes expressing their ideas, there is an increase in learning motivation in this indicator. This is supported by the use of crossword puzzles in learning time games tournament (tgt), a popular brainteaser that involves filling in the blanks (represented by white squares) with letters to create words based on provided instructions. With the help of crossword puzzles, physics science lessons that were previously thought to be challenging and boring for students can become simpler and more enjoyable because students become interested, dare to express their opinions, and take an active role in their education, enabling them to successfully complete physics science lessons. According to Mastuti and Aswi [37], self-confidence can motivate someone to take action, and if that person takes action motivated by self-confidence, that person will be able to make decisions and make the proper, accurate, efficient, and effective choices. People who are more self-assured will be better able to inspire them to grow and improve.

Satisfaction. The greatest rise in student motivation has been for satisfaction measures. According to the research's findings for the relevance satisfaction class VII B SMPN 2 HALONGONAN TIMUR, the initial motivation score for the low category was 2.43 while the final motivation score for the high category was 3.15. This is evident from the gain value obtained from the average score for the seven statements, which was 0.46 in the medium category. This is because the application of crossword puzzles makes students' learning methods more active, interesting, not monotonous and boring which can cause students' feelings of pleasure in learning, so that it can cause a sense of satisfaction for students when studying lessons on solar system material. In line with Sari's research [38] the results of the ARCS questionnaire in her research stated that the percentage of student satisfaction levels in learning physics was the highest. Students feel satisfied with the physics learning they follow so that students feel motivated.

4 Conclusion

According to the data analysis findings, it can be stated that using crossword puzzles in learning team games tournaments (tgt) in class VII B SMPN 2 HALONGONAN TIMUR in solar system subject improves student learning motivation. Students' learning motivation from the four indicators namely attention, relevance, confidence and satisfaction all improved with an average improve in student motivation of 0.40 in the medium category.

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