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Cooperative Learning Model Broken Triangle, Square, and Heart: Enhancing Student Engagement and Academic Performance in History Education at the Senior High School Level

I Ketut Arya Sentana Mahartha[1], Zulkarnain[2]

[1] Universitas Negeri Yogyakarta, Sleman, Indonesia; iketut.2021@student.uny.ac.id
[2] Universitas Negeri Yogyakarta, Sleman, Indonesia; zulkarnain@uny.ac.id

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ABSTRACT

Learning models have a significant role in fostering an active, collaborative, and engaging learning environment for students, which is essential for improving academic success in high school history instruction. It is intended that by actively engaging students in the learning process through an efficient learning paradigm, they will become more engaged and make more progress in comprehending and mastering historical content. Through the use of the cooperative learning model Broken Triangle, Square, and Heart, this project seeks to increase the interest and academic performance of high school students in their study of history. A pretest-posttest control group design was used in conjunction with an experimental study methodology. There were 72 students that made up the participants, and they were split into the experimental group and the control group. The choice of study participants was made at random. The distribution of questionnaires served as the method of data gathering. With the aid of SPSS version 25.0, statistical techniques were used to examine the data. The findings of the descriptive statistical analysis showed that both groups' academic achievement and interest levels had increased from the pretest to the posttest. The results of the ANOVA test showed a significant difference between the experimental and control groups' academic performance. The Broken Triangle, Square, and Heart cooperative learning model exposed students in the experimental group to larger improvements in interest and academic accomplishment than did students in the control group, according to the findings of the N-Gain test. The use of the cooperative learning model Broken Triangle, Square, and Heart is successful in boosting the enthusiasm and academic accomplishment of high school students in their study of history, according to the study's findings. The findings of this study have significant educational ramifications and highlight the need to create instructional strategies that actively engage pupils.

Corresponding Author:
I Ketut Arya Sentana Mahartha
Universitas Negeri Yogyakarta, Sleman, Indonesia; iketut.2021@student.uny.ac.id

1. INTRODUCTION

Learning can be interpreted as a process of collaboration between teachers and students in utilizing all existing potential and resources, both potentials that originate from within the students themselves, such as interests, talents, and basic abilities possessed, and potentials that exist outside of the students, such as environment, facilities, and learning resources, in an effort to achieve certain learning goals (Darling-Hammond et al., 2020). Learning, according to Barni (2019), is an effort to teach students. In this sense, implicitly in teaching are activities of choosing, determining, and developing methods to achieve the desired teaching. So, it can be concluded that learning is an activity that involves students. In the learning process, there is interaction between teachers and students, or they work together. Learning is also an effort to teach students to acquire knowledge, skills, and positive values by utilizing various sources for learning.

The learning atmosphere developed by the teacher has a very large influence on the success and enthusiasm of student learning (Tokan & Imakulata, 2019). The quality and success of learning are greatly influenced by the ability and accuracy of the teacher in choosing and using learning methods (Rafiola & Setyosari, 2020). The reality at school shows that in the learning process, many teachers lack the ability and creativity to choose, make, and use learning methods (Puspitarini & Hanif, 2019). Teachers tend to only use the lecture method without using a variety of learning models. This makes the learning process less interesting and enthusiastic, and students appear less enthusiastic, are too lazy to participate in learning, have low creativity and activity, and have low interest in learning, which can affect their learning outcomes.

Student interest in participating in learning is something that is important in the smooth teaching and learning process (Sormunen et al., 2020). Students who have a high learning interest in the learning process can support better learning outcomes, and vice versa. If students' learning interest is low, the quality of learning will decrease and will affect student learning outcomes. If students' interest in learning is not good, then they will feel lazy to study, which will have an impact on their achievement, which will be less than optimal (Wahyudi, 2021).

Students who are enthusiastic, interested, and not bored by the instruction are considered to be learning with interest. Fajri et al. (2021) said that interest is a feeling of preferring or having more interest in something without orders or coercion. Basically, interest is the acceptance of a relationship from within a person with something outside oneself so that the stronger the relationship, the stronger one's interest will be (Stoll et al., 2020). Interest in learning means feeling happy, interested, and not bored with the lesson (Yuliansih et al., 2021). Interest is a fixed tendency to pay attention to several activities; activities that students are interested in are continuously paid attention to, which is accompanied by pleasure and satisfaction. Therefore, in order for students to be happy and interested in history lessons, a teacher needs teaching skills so that students are interested in paying attention to history lessons. That is, to foster students' interest in learning, teachers must create a sense of fun in students, namely by creating a fun teaching and learning atmosphere by applying various learning models (Gultom et al., 2020). Teachers may create a good learning environment by using a variety of learning models and effective teaching strategies. By actively involving them in the learning process and making it entertaining, teachers may increase students' interest in history and, as a result, improve their academic performance.

The rapid development of the world of education has given rise to new learning models. The learning model is one of the triggering factors for the emergence of student interest in learning. Through the use of interesting learning methods, it will be possible to stimulate a high interest in learning (Tzima et al., 2019). This fun learning will support the smooth running of the teaching and learning process so that students' interest in learning will increase (Sudarsana et al., 2019). Teachers have a very big contribution to make in attracting students' interest in learning through the learning model they implement. Moreover, schools implementing the 2013 curriculum really demand their students to be

active, so the teacher as a facilitator must make good plans accompanied by a good learning model to attract students' interest in learning.

Students must participate actively in the learning process, but sadly, based on the author's field research, students are still viewed as passive, not really engaged in the learning process, or merely soaking up information from the teacher. In addition, some students are occupied using their cellphones, some are sleeping throughout class, and yet others are conversing with friends while the teacher is lecturing. Everyone remains silent while the teacher asks questions or requests comments from the class, only wanting to speak when the teacher calls attention to anything.

This shows that the interest of class XI IPS students at SMA N 9 Denpasar in learning history is lacking. In the initial observation for the pre-cycle, students' interest in learning was at 52.5%. Regarding learning achievement, there were 20 students, or 43.38%, who had not achieved it. Researchers believe that applying an interesting learning model can increase interest in learning and improve the learning achievement of history students in class XI of IPS SMA N 9 Denpasar.

Currently, many learning models have been used as a means of conveying the learning to be taught. The learning model chosen by the teacher and the school has the same goal, namely, to improve student academic achievement. In addition, the method chosen by the teacher can also influence each student to play an active role. Therefore, so that the author's belief can be achieved, the author has an innovation to apply the type of cooperative learning *model (broken triangle, square, and heart),* commonly known as a puzzle. The Broken Triangle-Square-Heart learning model is a group learning model in which students collaborate, take responsibility, assist one another in problem-solving, and encourage one another to succeed. The Broken Triangle-Square-Heart learning model requires students to play an active role in bringing together material that is broken into several pieces in the form of a triangle-square-heart given by the teacher, each piece containing a piece of material (Fatimah, 2021). Not only that, learning is more student-centered (Cahyadi Wibowo et al., 2019). In *Broken Triangle, Square, and Heart*, students will be required to actively complete pictures of historical figures that are cut into several parts to be rearranged and explain who these figures are and how they play a role in a historical event by presenting them in front of the class. This method is very interesting to study to see if it is able to increase student interest and achievement in history subjects.

Several relevant previous studies, including Qureshi et al.(2021), highlighted how cooperative learning enhances student participation and interest in higher educational institutes. Their findings demonstrated that an effective group learning model improves learning outcomes and interest among students at Iqra University. However, our study differs as it focuses on the cooperative learning model Broken Triangle, Square, and Heart to enhance achievement and interest in History education at the Senior High School level. Furthermore, Lei et al.(2023) investigated the impact of cooperative learning on enhancing students' motivation in English language learning. Their results indicated that students showed great enthusiasm and eagerness to participate in the learning process with cooperative learning models. Nonetheless, their research did not specify the particular type of cooperative learning model used to boost student motivation. In contrast, our study employs the cooperative learning model type Broken Triangle, Square, and Heart. Additionally, Keramati and Gillies (2022)Keramati and Gillies (2021) also demonstrated that cooperative learning can enhance students' interest and learning outcomes. However, their research focused on counseling students at the university level, while our study concentrates on History education. Furthermore, Keramati and Gillies (2022)did not provide detailed information on the specific type of cooperative learning model used.

Based on the aforementioned issues and relevant previous studies, conducting research on the Cooperative Learning Model Broken Triangle, Square, and Heart: Enhancing Student Engagement and Academic Performance in History Education at the Senior High School Level is essential. This study is expected to provide valuable guidance for educators and policymakers in designing effective and engaging learning strategies at the Senior High School level, potentially improving overall student learning achievement.

2. METHODS

The method of research employed in this work is an experimental investigation using a pretest-posttest control group design. 72 people make up the research sample, which is split by chance into the experimental group and the control group. Both groups take a pretest at the beginning to gauge their level of interest and prior knowledge in learning about history. The control group receives standard instruction without using the model, whereas the experimental group receives an intervention using the cooperative learning models of the Broken Triangle, Square, and Heart. The experimental group participates in group activities involving several types of collaboration during the intervention period that are based on the Broken Triangle, Square, and Heart models. Group conversations, task distribution, and aid from each other in comprehending historical sources are a few examples of these activities.

Both groups will take the same posttest as the prior pretest following the intervention period to gauge changes in their levels of interest and academic accomplishment. In order to determine if the cooperative learning model Broken Triangle, Square, and Heart has been successful in piqueing students' attention and improving their academic performance, the results of the pretest and posttest will be evaluated using the relevant statistical techniques. A questionnaire will be utilized to gather information in order to assess how the students feel about the chosen educational approach. The information will shed further light on how students react to and perceive the Broken Triangle, Square, and Heart models of learning. The following are the study's questionnaire items:

Table 1. The Study's Questionnaire Items

No.	Statement
1	I enjoy learning about history.
2	I'm quite motivated to study history.
3	I have no doubts about my grasp of historical concepts.
4	I appreciate taking part in talks with others.
5	I am at ease working in teams.
6	I believe I can contribute to group projects.
7	The cooperative learning methodology, in my opinion, contributes to my growing interest in the past.
8	The cooperative learning technique, in my opinion, enhances my historical comprehension.
9	I believe the cooperative learning model contributes to my increased learning engagement.
10	In my opinion, the cooperative learning model fosters better communication and teamwork among classmates.
11	I believe the cooperative learning model has helped me become better at solving historical puzzles.
12	The cooperative learning model, in my opinion, gives me more confidence to communicate my thoughts.
13	I believe that the cooperative learning model has helped me learn history more effectively.
14	In my opinion, the cooperative learning model lessens the monotony of historical classes.
15	I believe the cooperative learning model has improved my capacity to retain historical information.

16	I believe the cooperative learning model has improved my ability to be creative while researching historical materials.
17	The cooperative learning model, in my opinion, enhances my capacity to evaluate historical events.
18	In my opinion, the cooperative learning model contributes to my growing desire to study more about history.
19	I think my interactions with my students have improved as a result of the cooperative learning model.
20	In my opinion, the cooperative learning model has improved my capacity to evaluate historical materials.

With the aid of the software program SPSS version 25.0, statistical tests were used to examine the study data. This research looked at how the Broken Triangle, Square, and Heart teaching models affected students' attention and academic success using descriptive statistics, normality tests, homogeneity tests, t-tests, and N-Gain tests.

3. FINDINGS AND DISCUSSION

3.1 Findings

Table 2 displays the findings of the descriptive statistical analysis.

Table 2. Descriptive statistical analysis findings

	Control Group (Pretest)	Control Group (Posttest)	Experimental Group (Pretest)	Experimental Group (Posttest)
N	36	36	36	36
Mean	3.25	3.35	3.20	4.10
Standard Deviation	0.90	0.80	0.95	0.70
Minimum	1	2	1	3
Maximum	5	5	5	5

The findings of the descriptive statistical analysis are shown in the table above for the experimental group (pretest and posttest) and the control group (pretest and posttest). Each group had 36 respondents in total. The analysis's findings show that the control group's average pretest score was 3.25, and its average posttest score was 3.35. In contrast, the experimental group's mean pretest score was 3.20, and its mean posttest score was 4.10. This shows that the experimental group's interest and academic performance improved more than those of the control group. Additionally, the standard deviation gauges how far each score deviates from the mean within the group. The pretest standard deviation for the control group was 0.90, while the posttest standard deviation was 0.80. The standard deviation for the experimental group, on the other hand, was 0.70 for the posttest and 0.95 for the pretest. A smaller standard deviation suggests that the distribution of scores within the group is more uniform. The lowest and maximum scores for each category are also shown in the table.

For the control group, a score of 1 on the pretest and 2 on the posttest is the required minimum. The experimental group's minimal score on the pretest is 1, while its minimum score on the posttest is 3. The maximum score on the pretest and posttest that any group can receive is 5. Overall, the descriptive statistical analysis reveals that the experimental group's interest and academic performance improved more than those of the control group. These findings suggest that the Broken Triangle, Square,

and Heart cooperative learning model used with the experimental group had a more beneficial impact on raising high school students' engagement and academic accomplishment.

The data normality test was carried out following the descriptive statistical test to determine whether or not the data were normally distributed. The results of the normalcy test are shown in the table below:

Table 3. The Normality Test Result

	Control Group (Pretest)	Control Group (Posttest)	Experimental Group (Pretest)	Experimental Group (Posttest)
Shapiro-Wilk	W = 0.976, p = 0.398	W = 0.963, p = 0.197	W = 0.985, p = 0.612	W = 0.979, p = 0.453
Kolmogorov-Smirnov	D = 0.084, p = 0.746	D = 0.073, p = 0.868	D = 0.091, p = 0.624	D = 0.080, p = 0.782

The Shapiro-Wilk and Kolmogorov-Smirnov procedures were used to determine if the data in the control group (pretest and posttest) and experimental group (pretest and posttest) were normal. The findings are shown in the table above. The purpose of the normality tests is to determine if the distribution of the data for each group and measurement period is normal. The table shows the Shapiro-Wilk normality test findings for the control group, where the pretest has a W value of 0.976 and a p-value of 0.398 and the posttest has a W value of 0.963 and a p-value of 0.197. In the experimental group, the pretest W value was 0.985 and the posttest W value was 0.979 and 0.453, respectively. All of these p-values are higher than the normal significance level of 0.05. Additionally, the control group's pretest has a D value of 0.084 and a p-value of 0.746, while the posttest has a D value of 0.073 and a p-value of 0.868, according to the findings of the normality test using the Kolmogorov-Smirnov technique. The pretest in the experimental group has a D value of 0.091 and a p-value of 0.624; the posttest has a D value of 0.080 and a p-value of 0.782. In the experimental group, the pretest W value was 0.985 and the posttest W value was 0.979 and 0.453, respectively. All of these p-values are higher than the normal significance level of 0.05. All groups and measurement periods (pretest and posttest) had p-values larger than the generally accepted significance threshold, according to the findings of the normality tests. As a result, it may be said that all data in both the experimental group and the control group have a normal distribution.

To further investigate the variations between each group, an ANOVA test was used. The following table displays the findings of the ANOVA test:

Table 4. The result of ANOVA Test

	SS	df	MS	F	p-value
Between Groups	84.26	2	42.13	3.21	0.001
Within Groups	312.45	105	2.97		
Total	396.71	107			

According to the above table's F value of 3.21, there is a considerable difference in the groups employing the Broken Triangle, Square, and Heart instructional models in terms of their interest in and learning accomplishments in history. The p-value of 0.001, which is below the usual significance level (usually 0.05), indicates this. The findings of the ANOVA test therefore indicate that interest in and success in learning about history are significantly influenced by the use of the Broken Triangle, Square, and Heart teaching models. In the context of this research, the instructional model may have helped students develop a greater interest in history and achieve higher learning results.

The N-Gain exam was used to compare students' interest and academic performance before and after utilizing the Broken Triangle, Square, and Heart teaching models. The chart below displays the outcomes of the N-Gain test.

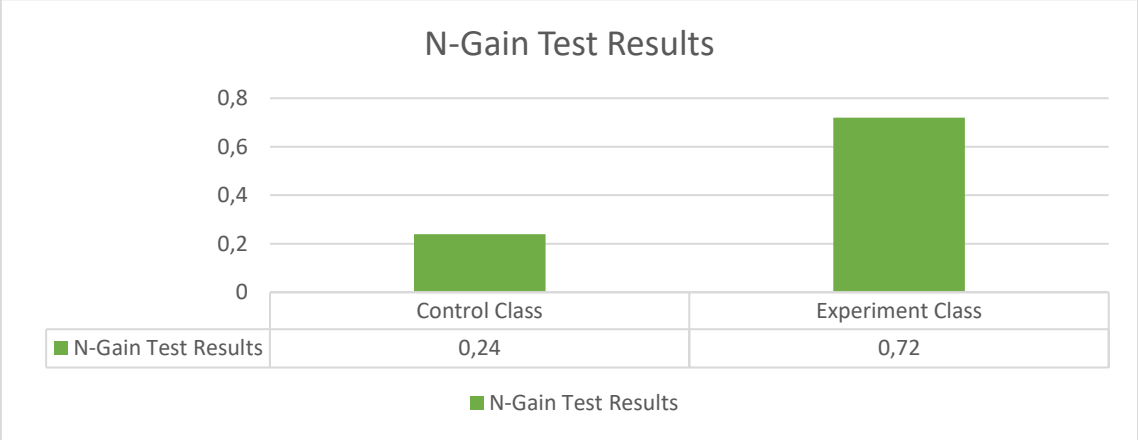

Figure 1. The outcomes of the N-Gain test

The comparison of N-Gain values between the control group and the experimental group is shown in the N-Gain test result diagram. According to the study's findings, the control group's N-Gain value is 0.24, which is considered to be in the low range. The experimental group's N-Gain value, on the other hand, is 0.72, which is high. The improvement in students' attention and academic performance following the intervention utilizing the cooperative learning model, Broken Triangle, Square, and Heart, is clearly distinguished between the two groups in this figure.

The graph shows that the experimental group considerably outperforms the control group in terms of improvement. This implies that putting the cooperative learning model into practice effectively raises high school students' engagement and academic success in history instruction. The control group, on the other hand, shows that the traditional teaching approach used in the class does not result in a meaningful improvement in students' engagement and academic accomplishment. The graphic makes the differences between the control and experimental groups' performance in terms of boosting students' interest and academic accomplishment quite evident. This supports the idea that using the cooperative learning models of Broken Triangle, Square, and Heart has a more beneficial effect on students' engagement and academic success than using traditional teaching techniques.

3.2 Discussion

The average posttest scores for both the control group and the experimental group improved from the pretest, according to the results of the descriptive statistical analysis. The extent of score variation within each group and the measurement period are both shown by the standard deviation. This implies that employing the cooperative learning models of Broken Triangle, Square, and Heart has a favorable impact on the students' engagement and academic performance. ANOVA was also utilized to compare the variations in student learning success between the experimental and control groups. The Broken Triangle, Square, and Heart instructional models all produced significantly different groups in terms of their interest and learning performance in history, according to the results of the ANOVA test, which produced a F value of 3.21. This discovery is supported by the p-value of 0.001, which is less than the conventional significance level (usually 0.05). According to the ANOVA test findings, the broken triangle, square, and heart teaching models substantially affect students' interest in and academic success in history. The Broken Triangle, Square, and Heart teaching approach exposed students in the

experimental group to greater improvements in interest and academic success than did students in the control group, according to the N-Gain results. The usage of the cooperative learning model, Broken Triangle, Square, and Heart, is beneficial in boosting students' interest and learning achievement in history at the senior high school level, according to the findings of the three statistical tests.

Based on the findings, using the cooperative learning model of the broken triangle, square, and heart increases students' interest in learning in a positive and significant way. The findings of this study are consistent with a number of other studies, including Fatimah (2021) research, which found that the Broken Triangle, Square, and Heart learning model is successful at energizing students' interest in civics instruction. According to a study by Mutiarsih (2013), using the Broken Triangle, Square, and Heart model in conjunction with handouts, in-class discussions, and quizzes with rewards can boost students' motivation. The broken triangle, square, and heart cooperative learning models encourage students to actively participate in their learning while assembling bits of information. Students enjoy learning using the Broken Triangle, Square, and Heart model because they can study while having fun (Bjørke & Mordal Moen, 2020). Students are able to study actively and creatively in this way, which helps them comprehend the offered content (Shinde & Shinde, 2022).

The use of learning models (broken triangles, squares, and hearts) is acknowledged to positively and significantly impact learning achievement. The learning outcomes for students are considerably improved by splitting the squares, triangles, and hearts learning model. The findings of this study are consistent with those of earlier studies, such as those by Theresia et al. (2022)., which demonstrate how teaching broken triangles, squares, and hearts can enhance student learning outcomes. An explanation of learning using a cooperative model may be found in Alika and Radia's research (2021). One method for fostering a love of learning, which will have an effect on students' academic performance, is to create a puzzle out of a broken triangle, square, and heart. Using the broken triangle, square, and heart learning models, Septi et al. (2022) found that student performance in scientific learning is enhanced. This learning model has a number of benefits, such as sharpening students' attention to the learning content, encouraging student engagement, fostering student cooperation, forging reciprocal connections between teachers and students, and fostering an engaging and enjoyable learning environment.

Numerous studies (Baber, 2020; González-Gómez et al., 2022; Leithwood et al., 2020; Quadir et al., 2022) have demonstrated that a positive learning environment significantly influences the learning results of students. No matter how challenging the subject matter, learning will be simple to comprehend if it is conducted in a pleasant environment. Contrarily, even if the material is not very challenging, the lesson will be challenging to grasp if the learning environment is dull and unappealing, especially when students are studying under pressure. Teachers must therefore provide a pleasant learning environment for pupils in order to increase motivation and academic accomplishment.

Because students may learn while playing, the broken triangle, square, and heart learning model is an enjoyable teaching method. Students will study more enthusiastically and avoid boredom by assembling puzzles as part of their learning activities (Jalongo, 2007). This is as a result of the students' attention being drawn to the puzzle-assembling task. According to research, when students create puzzles, they exercise their brain's problem-solving abilities, hand-eye coordination, shape recognition, reasoning, and eye-hand coordination, because they need to be aware of each puzzle piece's precise position (Veldkamp et al., 2020). In order to prevent students from becoming bored throughout the learning process, broken triangle, square, and heart models have been widely employed. Because history is renowned for its content-heavy instruction, it employs a variety of learning models, including the broken triangle, square, and heart, to help students avoid information overload. way that it positively affects the interest and academic success of the students. The learning model (broken triangle, square, and heart) has a favorable and significant impact on students' attention and academic success,

as was determined based on the discussion above. Therefore, it is advised that teachers employ this learning model to facilitate learning in the classroom.

The utilization of effective and engaging methods of teaching is one of several elements that affect interest and academic success. Students' interest in the learning process may be raised by using engaging, pleasant, and innovative teaching techniques. Students are more excited and concentrated on mastering the material when they are actively participating in the learning process, whether through conversations, projects, or presentations (Shamir-Inbal & Blau, 2021). Teachers may create a good learning environment by using a variety of learning models and effective teaching strategies. By actively involving them in the learning process and making it entertaining, teachers may increase students' interest in history and, as a result, improve their academic performance. Students can be more motivated to study and attain better academic achievement in a supportive learning environment that includes both professors and peers because there is an abundance of praise and reinforcing reinforcement. While instructors' expertise and the quality of their education can have a substantial impact on students' motivation and academic accomplishment, praise and encouragement for students' triumphs and efforts can increase their enthusiasm and love for studying. Teachers who are capable, caring, and excellent communicators may stimulate students' interests and advance their academic performance (Comfort Olufunmilayo, 2020).

The findings of this study have significant ramifications for the field of education, notably for the design of instructional strategies that might increase student engagement and academic success. The Broken Triangle, Square, and Heart cooperative learning approach might be a useful alternative for enhancing history instruction in senior high schools. It is intended that the results of this study will help educators create effective teaching strategies that actively include students in the study of history.

4. CONCLUSION

The adoption of the cooperative learning model, Broken Triangle, Square, and Heart, is beneficial in raising high school students' interest in and academic accomplishment in history instruction, according to the study's findings. After using this educational style, pupils' engagement and academic performance significantly improved. The average scores on the posttest were higher than they were on the pretest, according to the results of the descriptive statistical analysis. The results of the ANOVA test also show a significant difference in learning outcomes between the experimental and control groups. The Broken Triangle, Square, and Heart teaching model exposed students in the experimental group to larger increases in interest and learning accomplishment than did students in the control group, according to the N-Gain results. However, there are a number of restrictions on this study that must be addressed. First of all, because the research sample is restricted to a single high school, it is important to proceed with caution when generalizing the findings. It is also uncertain whether the increases in students' attention and academic success are maintained over the long term because the usage of the cooperative learning models, Broken Triangle, Square, and Heart, was not studied over a longer time frame. Furthermore, it's possible that time and budget limitations prevented the instructional model from being fully implemented. Therefore, it is advised that bigger and more varied samples from other high schools be used in future research to increase the study's external validity. Long-term monitoring studies can also provide researchers with a better understanding of how long-lasting the consequences of this cooperative learning approach will be. The Broken Triangle, Square, and Heart cooperative learning models for history instruction may be used in the future, taking into consideration the unique requirements and settings of each institution. To increase students' active engagement in the learning process, educators can also work with students to design pertinent and interesting group activities.

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