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The Effect of The Student Teams Achievement Division (STAD) Learning Model On The Learning Outcomes of Forward Roll In Floor Gymnastics Learning For Female Students of Grade XII SMAN 2 Sumedang In The 2023 Academic Year

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ABSTRACT

Floor gymnastics is a part of the gymnastics group. Following the term floor, the gymnastics movements are performed on a mat or carpet. Front roll is a forward rolling movement over the back of the body (nape, back, piggag, back of the hip). The purpose of this study was to determine the effect of the student teams achievement division (STAD) learning model on the learning outcomes of front rolls in floor gymnastics learning for female students of class XII SMAN 2 Sumedang in the 2023 academic year. The research method used in this study is an experimental method using an instrument, namely a front roll. Data were taken from the initial test and the final test. The population of this study was all female students of class XII SMAN 2 Sumedang in the 2023 academic year, totalling 125 people, and the sample used was 25 female students of class XII SMAN 2 Sumedang. Based on the results of data processing, there were significant differences. This is indicated by the average value of the final test results achieved by the sample after receiving treatment, which is 75.64, where before receiving treatment, namely the initial test, the average value was 65.76. Meanwhile, regarding its significance, it can be seen from the increase test, which shows significant results at a real level of 0.05 with a degree of freedom of 10.3, namely t count> t table = 10.3> 1.711. So that the influence of the student teams' achievement division (STAD) learning model on the learning outcomes of forward rolls in floor gymnastics learning is 15%.

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INTRODUCTION

Physical education (PE) is an essential component of holistic education, contributing not only to physical development but also to students' social, emotional, and cognitive growth (Logan et al., 2018). Among the various activities in PE, gymnastics plays a pivotal role in enhancing body coordination, flexibility, balance, and motor control

(Rudd et al., 2015). Floor gymnastics, in particular, provides a foundation for many physical skills, promoting body awareness, strength, and movement efficiency.

Forward rolls are one of the fundamental gymnastic movements typically introduced during school years. This movement is not only a technical exercise but also builds confidence and competence in body movement, forming a gateway to more complex gymnastic activities (Sicilia et al., 2019). However, teaching such motor skills effectively requires appropriate instructional strategies tailored to students' needs and learning styles.

In recent years, educational research has emphasized the importance of active and collaborative learning approaches to enhance student engagement and academic achievement. One such model is the Student Teams Achievement Division (STAD), a cooperative learning method developed by Slavin (1995) that organizes students into small, heterogeneous groups to work together toward common academic goals. Within these teams, students are responsible for both their learning and the group's success. After learning activities, students are assessed individually, and their scores contribute to the team's average, fostering accountability and motivation (Gillies, 2016).

In the context of physical education, especially for skill-based tasks such as gymnastics, STAD allows peer modelling, encouragement, and correction—factors that significantly contribute to motor skill acquisition (Casey & MacPhail, 2018). Female students in particular often benefit from cooperative learning environments that emphasize support, collaboration, and shared success, rather than individual competition (Bailey et al., 2021).

The application of STAD in PE, especially for female high school students learning forward rolls, could enhance outcomes by allowing students to learn from each other, practice together, and receive feedback in a less intimidating environment. This approach can help overcome common barriers to gymnastics learning, such as fear, low confidence, or a lack of teacher attention due to large class sizes.

Despite the potential advantages of the STAD learning model, many physical education classes continue to rely on traditional, teacher-centred instruction. In such settings, students often receive limited individual guidance, leading to uneven learning outcomes, especially for complex motor skills such as forward rolls. Female students may also be less likely to actively participate in gymnastic activities if they feel unsupported or judged during practice (Ennis, 2017).

At SMAN 2 Sumedang, it was observed that many Grade XII female students struggle to master the forward roll technique in floor gymnastics. These difficulties stem from several factors, including a lack of self-confidence, minimal feedback, and insufficient practice opportunities. Moreover, the conventional instruction methods being used are not sufficiently student-centred, limiting their effectiveness for diverse learning styles.

There is thus a pressing need to explore alternative instructional models that can support more inclusive, engaging, and effective learning in PE classes, especially in the context of female students and skill-based learning such as gymnastics.

Although there has been considerable research on cooperative learning models such as STAD in general academic contexts, studies investigating their effectiveness in

physical education—and specifically in gymnastics—remain limited. Existing research largely focuses on cognitive subjects like mathematics or science, with minimal application to motor skill learning (Putra et al., 2021).

Furthermore, while several studies have highlighted the benefits of cooperative learning in enhancing motivation and teamwork, few have examined its direct impact on technical skill acquisition in floor gymnastics among female high school students (Pratama & Wardhani, 2020). Most available studies in PE tend to be gender-neutral or male-dominated, overlooking gender-specific challenges and benefits.

In the Indonesian educational context, studies evaluating STAD in physical education are rare and often lack methodological rigour or specificity in terms of skill type, such as forward rolls. Therefore, there is a need for more targeted research that examines the implementation of STAD in gymnastic skill development, particularly for female students who may have unique learning dynamics.

This study provides a novel perspective by applying the STAD cooperative learning model to the teaching of forward rolls in floor gymnastics specifically for Grade XII female students at SMAN 2 Sumedang. Unlike previous studies that focus on general outcomes, this research examines skill-specific learning outcomes within a real classroom context. The focus on gender-specific analysis adds further depth and relevance, as it sheds light on how cooperative learning models can support female students' physical skill development.

Moreover, the study uses a quantitative pre-test and post-test experimental design, which strengthens the evidence base for STAD's effectiveness in a physical education setting. The study also contributes to the growing field of pedagogical innovation by integrating collaborative learning theories into practical PE instruction, aligned with current educational reforms that emphasise student-centred learning.

In light of the growing need for effective, inclusive, and skill-specific instructional strategies in physical education, this study aims to evaluate the effect of the Student Teams Achievement Division (STAD) learning model on the learning outcomes of forward roll in floor gymnastics among Grade XII female students at SMAN 2 Sumedang in the 2023 academic year.

The primary research question is: Does the STAD learning model significantly improve the forward roll performance of female high school students compared to traditional instructional methods? Through empirical investigation and statistical analysis, this study seeks to provide educators and policymakers with actionable insights on how to enhance physical education learning through cooperative, student-centred approaches. By doing so, it contributes to the broader goal of improving educational equity, participation, and outcomes in physical education, particularly for female students.

METHODS

Method is a way that is systematically arranged and well thought out to obtain or achieve a goal, while research is a careful examination or research on a particular object. To prove the truth of the hypothesis that the author proposed, the author conducted

research using the experimental research method. So the reason the author used the experimental research method was because the problem faced was to find out how much influence the STAD learning model had on the learning outcomes of the forward roll in floor gymnastics learning for female students of class XII of SMAN 2 Sumedang. The sampling technique in this study was the simple random sampling technique. The author took a sample of 20% of the population of 125 female students of class XII of SMA Negeri 2 Sumedang. So the sample in this study is 125 x 20% = 25 people.

RESULTS AND DISCUSSION

The results of the study are data obtained from the initial test scores and the final test of front roll floor gymnastics. The data in this study were obtained through the form of learning front roll floor gymnastics. The test was conducted twice, namely the initial test before treatment and the final test after treatment. The data is a raw score that needs to be processed, because data processing is one of the important and absolute steps to be carried out so that the data provides an answer to the hypothesis proposed. To process the data obtained from the floor gymnastics test (front roll), statistical formulas are used so that it can be known whether there is an influence and how much influence the treatment has. The average value and standard deviation of each test, namely the initial test and the final test. The results can be seen in Table 1 below:

Table 1.

Mean Value, Standard Deviation and Improvement of Floor Gymnastics Test (forward roll)

Test Type	Mean	Standard Deviation
Pre-test	65,76	9,84
Post-test	75,64	7,63
Improvement	9,84	4,78

Table 1 shows that the average of the initial test of the forward roll using the STAD learning model is 65.76 with a standard deviation of 9.84, while the average of the final test of the forward roll using the STAD learning model is 75.64 with a standard deviation of 7.63. To test the normality of the data, the author uses the Lilliefors test. The results of the data normality test can be seen in Table 2 below.

Table 2.

Results of Front Roll Floor Gymnastics Data Normality Test

Test Type	L count	L table	Result
Pre-test	0,119	0,173	Normal
Post-test	0,165	0,173	Normal

From the data above, it can be seen that the L count of the initial test and the final test is smaller than the L table at a real level of 0.05, which means it is normally distributed. It can be seen in the table in the appendix. The next test is a significance test; the aim is to find out whether the sample has experienced a significant increase or not after they received treatment. The results of the test can be seen in Table 3:

Table 3.
Significance Test Results

T count	T table	Result
10,3	1,711	Significant

In Table 3, the t count is 10.3. From the list of t values with a real level (α) = 0.05 degrees of freedom (dk) = n-1 (25), the number 24 is obtained. Because the t count (10.3) is greater than the t table (1.711), the hypothesis is rejected because it is outside the acceptance area. This study shows that there is a significant increase in the influence of the STAD learning model on the basic movement of the front roll. The results of the test to improve the front roll floor gymnastics test on floor gymnastics are as follows:

Improvement = $\frac{9,84}{65,76}\ x\ 100\%$

= 15%

Based on data processing and data analysis conducted by the author on the results of the student's test, there was an increase in the basic forward roll movement by applying the STAD learning model. The results can be seen in Table 1, where the average value of the initial test was 65.76, while the final test was 75.64, so that there was a difference of 9.84. This shows that there was an increase in students' basic movements after being given treatment. In addition to proving the increase in students' basic movements, the author conducted an increase test. This can be seen in Table 3, which shows significant results at the real level (α) = 0.05, namely t count > t table = 10.3 > 1.711. Thus, the initial hypothesis has been proven true, namely that the STAD learning model has a significant influence on the basic forward roll movement.

CONCLUSION

After completing the research process in this study, the author can present conclusions that are supported by statistically tested data as follows.

1. The Student Team Achievement Division (STAD) learning model has an influence on the basic forward roll movement in floor gymnastics for female students of class XII of SMA Negeri 2 Sumedang.
2. The Student Teams Achievement Division (STAD) learning model has a significant influence on the basic forward roll movement for female students of class XII of SMA Negeri 2 Sumedang. This is evidenced by the increase test, which shows significant results at a real level of 0.05, namely: t count > t table = 10.3 > 1.711.

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