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The Effectiveness of Cooperative Learning Compared to Traditional Methods in the Acquisition of Floor Gymnastics Skills Among Second Year Students Al-Nusoor University Faculty of Physical Education and Sports Sciences

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ABSTRACT
The purpose of the study was to determine the influence of cooperative learning methods and traditional methods on the mastery of floor gymnastics skills (front bolster, back bolster, handstand, headstand) in second-year students, and to compare the effectiveness of the two methods. Experimental research with a two-group design (experiment and control) using pre-test and post-test. The sample totaled 40 students, divided into experimental (n=20, cooperative method) and control (n=20, traditional method) groups, for 8 weeks (16 sessions). Data were analyzed by paired t-tests and independent t-tests via SPSS. The results of the study The experimental group showed a significant improvement in all four skills (front bolster: 2.40 to 4.15, t=8.32; rear bolster: 2.25 to 3.95, t=7.84; handstand: 1.90 to 3.60, t=7.10; headstand: 1.85 to 3.70, t=7.45). The control group also increased significantly but was lower (front roll: 2.35 to 3.45, t=5.17; rear roll: 2.20 to 3.30, t=4.93; handstand: 1.88 to 2.80, t=4.45; headstand: 1.80 to 2.85, t=4.62). At the post-test, the experimental group had a significant advantage over the controls on all skills (t ranged from 4.22–4.89; p<0.05). In conclusion, cooperative learning methods are more effective than traditional methods in improving the mastery of floor gymnastics skills of second-level students, so it is recommended as a methodological alternative to teaching.

Keywords: Cooperative learning; Traditional methods; Floor gymnastics; Motor skills.

ABSTRAK
Tujuan penelitian untuk mengetahui pengaruh metode pembelajaran kooperatif dan metode tradisional terhadap penguasaan keterampilan senam lantai (guling depan, guling belakang, handstand, headstand) pada mahasiswa tingkat dua, serta membandingkan efektivitas kedua metode tersebut. Penelitian eksperimen dengan desain dua kelompok (eksperimen dan kontrol) menggunakan pre-test dan post-test. Sampel berjumlah 40 mahasiswa, terbagi menjadi kelompok eksperimen (n=20, metode

kooperatif) dan kontrol (n=20, metode tradisional), selama 8 minggu (16 sesi). Data dianalisis dengan uji-t berpasangan dan uji-t independen melalui SPSS. Hasil penelitian Kelompok eksperimen menunjukkan peningkatan signifikan pada keempat keterampilan (guling depan: 2,40 menjadi 4,15, t=8,32; guling belakang: 2,25 menjadi 3,95, t=7,84; handstand: 1,90 menjadi 3,60, t=7,10; headstand: 1,85 menjadi 3,70, t=7,45). Kelompok kontrol juga meningkat signifikan namun lebih rendah (guling depan: 2,35 ,menajdi 3,45, t=5,17; guling belakang: 2,20 menjadi 3,30, t=4,93; handstand: 1,88 menjadi 2,80, t=4,45; headstand: 1,80 menjadi 2,85, t=4,62). Pada post-test, kelompok eksperimen unggul signifikan dibanding kontrol pada semua keterampilan (t berkisar 4,22–4,89; p<0,05). Kesimpulan metode pembelajaran kooperatif lebih efektif dibandingkan metode tradisional dalam meningkatkan penguasaan keterampilan senam lantai mahasiswa tingkat dua, sehingga direkomendasikan sebagai alternatif metodologis pengajaran.

Kata Kunci: Pembelajaran kooperatif; Metode tradisional; Senam lantai; Keterampilan motorik.

INTRODUCTION

Physical Education and Sports Sciences occupy a prominent position in the modern educational system, as their role is not limited to the development of physical abilities alone, but extends to include the development of the individual's character, social and psychological skills, and the instilling of values of cooperation and teamwork (Aksoy & Gürsel, 2017; Dudley, 2025; Mar et al., 2025). In light of this comprehensive educational approach, the teaching process in physical education faculties now faces fundamental challenges that require moving beyond traditional methods towards the adoption of teaching strategies that are more effective and better aligned with learners' needs (Al-Alawi, Muhammad Hassan, 2001, p. 47).

Recent decades have witnessed widespread academic interest in cooperative learning theory as one of the most prominent modern teaching approaches that has proven its effectiveness across various educational fields. This approach is based on the principle that students achieve their educational goals more effectively when working in small, cooperative groups, whose members share responsibility and exchange feedback amongst themselves (Abramczyk & Jurkowski, 2020; Han, 2015; Sibomana et al., 2021). Its core principles revolve around: positive interdependence, individual accountability, enhanced face-to-face interaction, the development of social skills, and group assessment (Al-Rabie, Mahmoud Daoud and Hamdamin, 2011, p. 203).

The field of gymnastics is no different from other sporting activities in terms of the need for advanced teaching methods; indeed, it is even more important given the precise motor skills it involves, which require a high degree of coordination between the nervous and muscular systems (Eshiev et al., 2024; Ren & Ma, 2025; Yang et al., 2026). Floor gymnastics is considered one of the most widely used branches of gymnastics inuniversity physical education, as it does not require complex apparatus and provides a solid motor foundation for learning the other disciplines of gymnastics (Hammad, Mufti Ibrahim, 1998, p. 156).

The basic skills in floor gymnastics include: the forward roll, the backward roll, the handstand, the headstand, the bridge, and other movements requiring precise coordination. Scientific studies have revealed that mastery of these skills is closely

linked to the quality of the teaching method employed and its ability to motivate the student and engage them positively in the educational process (Ratib, Osama Kamel, 1999, p. 89).

Floor gymnastics is classified as one of the most widespread branches of gymnastics in educational settings, as it does not require complex fixed apparatus and represents the motor foundation upon which the learning of all other apparatus is built (Hammad, Mufti Ibrahim, 2000, p. 78). The cooperative learning strategy falls within the active learning system, which is considered one of the most effective modern educational approaches for shifting the student from the role of a passive recipient to that of an active participant in constructing their knowledge and developing their skills (Al-Mousawi and Al-Shawi, 2020, p. 145)

Despite the recognised limitations of the traditional method based on rote learning and passive individual performance, it remains the predominant teaching style in many Iraqi physical education faculties, including Al-Nusur University. Through her direct contact with second-year students, the researcher observes that their level of skill acquisition in floor gymnastics falls short of expectations and that there is a clear lack of positive interaction within a teaching unit that relies on a command and abstract presentation (Al-Rabie, Mahmoud Daoud and Hamdamin, 2011, p. 217).

In contrast, the cooperative learning approach provides students with an interactive environment that boosts their self-confidence and encourages them to engage in constructive discussion and to correct their own mistakes with the help of their peers. Empirical studies have shown that this approach leads to a significant improvement in skill performance compared to the traditional approach across various types of sporting activities (Al-Alawi, Muhammad Hassan, 2001, p. 63) Furthermore, the use of this method in gymnastics specifically helps to alleviate the fear and hesitation associated with learning acrobatic floor movements, as the student feels surrounded by a supportive group sharing in the learning process (Ratib, Osama Kamel, 1999, p. 112).

The significance of this research lies in the fact that it presents a comparative field study within the specific context of an Iraqi university, namely Al-Nusoor University, and contributes to enriching the Iraqi sports literature with a rigorous empirical study that addresses a fundamental question regarding the feasibility of adopting a cooperative learning approach as an alternative to the traditional method in teaching floor gymnastics. The research also serves as a practical guide for faculty members in the college towards selecting the optimal method that achieves the highest level of skill acquisition for second-year students (Hammad, Mufti Ibrahim, 1998, p. 44).

Research Problem

Through direct field observation of second-year students at the Faculty of Physical Education and Sports Sciences, Al-Nusoor University, the researcher noted that reliance on the traditional method of teaching floor gymnastics resulted in a clear deficiency in students' acquisition of basic skills in this activity, prompting the researcher to ask: Is the cooperative learning method more effective than the traditional method in helping second-year students at Al-Nusoor University acquire floor gymnastics skills?

Research Objectives

1. To investigate the impact of the cooperative learning approach on the acquisition of floor gymnastics skills among second-year students at the Faculty of Physical Education and Sports Sciences, Al-Nusoor University.
2. To investigate the impact of the traditional method on the acquisition of floor gymnastics skills in the control group.
3. To compare the two methods in terms of the level of floor gymnastics skill acquisition in favour of the group with the best performance.

Research Hypotheses

1. There are statistically significant differences between the pre- and post-tests of the experimental group (cooperative learning method) in the level of floor gymnastics skill acquisition, in favour of the post-test.
2. There are statistically significant differences between the pre- and post-tests of the control group (traditional method) in the level of floor gymnastics skill acquisition, in favour of the post-test.
3. There are statistically significant differences between the experimental and control groups in the post-test for floor gymnastics skills, in favour of the experimental group.

Research Areas

1. Human Sciences Second-year students / Faculty of Physical Education and Sports Sciences / Al-Nusoor University / Baghdad
2. Location Gymnastics Hall / Faculty of Physical Education and Sports Sciences / Al-Nusoor University / Baghdad
3. Temporal Domain Second semester of the academic year 2025–2026

METHODS

Research Methodology

The researcher adopted an experimental approach, designing two equivalent groups (experimental and control) with pre- and post-tests, as this was appropriate for the nature of the research, which aims to reveal the effect of an independent variable (cooperative learning style) on a dependent variable (acquisition of floor gymnastics skills). The experimental approach is considered the optimal scientific method for establishing causal relationships between study variables in the field of physical education and sports science (Al-Rabie, Mahmoud Daoud and Hamdamin, 2011, p. 38).

Research Population and Sample

The research population consists of second-year students at the Faculty of Physical Education and Sports Sciences, Al-Nusoor University, for the academic year 2025–2026, numbering 60 students. The researcher selected a purposive sample of 40 students, whom she randomly divided into two equivalent groups:

1. Experimental group: 20 students, taught by the researcher using the cooperative learning method.
2. Control group: 20 students, whom the researcher taught using the traditional (direct instruction) method.

The researcher verified the equivalence of the two groups in the following variables before commencing the experiment: chronological age, height, weight, and pre-test performance level in the selected skills. The necessary statistical analysis was

conducted to verify the absence of statistically significant differences between the two groups in the pre-test (Al-Alawi, Muhammad Hassan, 2001, p. 182).

Variables and Tests

The researcher relied on the following basic skills in floor gymnastics, which are documented in specialist literature and can be measured using an objective assessment tool:

1. Forward roll

Method of execution: The gymnast stands in an upright position, bends their knees and places their hands on the mat shoulder-width apart. They push their feet forwards and turn their head inwards so that the back of the head touches the mat. They complete the rotation, returning to a squatting position and then standing up. Assessment method: A judging panel of three judges assesses the performance on a five-point scale (5–1) based on the criteria of the International Gymnastics Federation (Hammad, Mufti Ibrahim, 1998, p. 162).

2. Back roll

Performance method: The participant stands with their back to the direction of movement, lowers into a squatting position, places their hands beside their head on the mat, pushes backwards with their body weight, turns their head so that the back of their neck touches the mat, and finishes in a standing position. Assessment method: A five-point rating scale based on the same criteria (Al-Rabie, Mahmoud Daoud and Hamdamin, Saeed Saleh, 2011, p. 228).

3. Assisted handstand

Performance method: The subject stands facing a wall or with the partner's assistance, places their hands on the mat shoulder-width apart, and raises their legs one after the other to reach a vertical handstand position, with the body fully extended and the gaze between the hands. Assessment method: A five-point rating scale based on body alignment, duration of stability and limb balance (Ratib, Osama Kamel, 1999, p. 103).

4. Assisted headstand

Performance method: The subject forms an equilateral triangle with their hands and head on the mat, gradually raises both legs upwards until reaching a vertical position, and maintains the stability of their centre of gravity. Assessment method: The committee assesses the stability and duration of the position, as well as the regularity of body posture, using a five-point rating scale (Al-Alawi, Muhammad Hassan, 2001, p. 91)

The main experiment

The main experiment lasted for 8 weeks, comprising two teaching sessions per week, totalling 16 teaching sessions, each lasting 90 minutes. The cooperative learning method was applied to the experimental group in accordance with the following steps:

a. Dividing the students into small groups of 4–5 students.
b. A clear role was assigned to each member of the group (implementer, monitor, corrector, facilitator).
c. The researcher presented the prototype of the skill, followed by cooperative training within the groups.
d. Feedback was provided first by peers and then by the researcher.

The effective application of cooperative learning in physical education lessons requires the definition of clear roles within each group (implementer, observer,

corrector) and ensuring that these roles rotate among members across teaching units to ensure that all students benefit. (Dyson & Casey, 2016, p.45)

As for the control group, the traditional method (direct instruction) was applied, which relies on the researcher demonstrating the model and the students performing it individually in sequence without organised group interaction (Al-Rabie, Mahmoud Daoud, 2011, p245.).

Statistical Methods

The researcher used the following statistical methods, utilising the SPSS statistical software package:

1. Arithmetic mean – to describe the performance level of each group.
2. Standard deviation – to determine the degree of variation in performance scores.
3. t-test for two independent samples – to compare the experimental and control groups in the post-test.
4. Paired t-test – to compare the pre- and post-tests for each group separately.
5. Skewness coefficient – to check the normality of the data distribution. (Al-Alawi, Muhammad Hassan and Ratib, 1999, p. 210).

RESEARCH RESULTS

Presentation of the results of the pre- and post-tests for the experimental group

Table 1. Results of the t-test between pre- and post-tests for the experimental group

Skill	Pre-test mean	Post-test mean	Calculated t-value	Significance (0.05)
Forward roll	2.40	4.15	8.32	Function
Backward roll	2.25	3.95	7.84	Function
Handstand	1.90	3.60	7.10	Function
Headstand	1.85	3.70	7.45	Function

Table 1 shows that there are statistically significant differences between the pre-test and post-test in favour of the post-test for all four skills in the experimental group, with clear differences in the mean scores. This improvement is attributed to the nature of the cooperative learning approach, which provided students with multiple opportunities for practice and immediate feedback from peers, thereby contributing to the acceleration of skill acquisition and the correction of motor errors at an early stage of learning (Ratib, Osama Kamel, 1999, p. 134)

Presentation of the results of the pre- and post-tests for the control group

Table 2. Results of the pre- and post-test (T) for the control group

Skill	Pre-test mean	Post-test mean	Calculated t-value	Significance (0.05)
Forward roll	2.35	3.45	5.17	Function
Rear roll	2.20	3.30	4.93	Function
Handstand	1.88	2.80	4.45	Function
Headstand	1.80	2.85	4.62	Function

Table 2 shows that the control group also achieved a significant improvement between the pre- and post-tests, although the extent of this improvement was smaller compared to that achieved by the experimental group. This can be explained by the fact that the traditional method allows for a degree of learning based on repetition and

imitation; however, its lack of organised group interaction and immediate feedback limits the maximum level of skill acquisition that a student can achieve (Al-Rabie, Mahmoud Daoud 2011, p. 253).

Presentation of the results of the comparison between the two groups in the post-test

Table 3. Results of the t-test between the two groups in the post-test

Skill	Experimental group	Control group	Calculated t-value	Significance (0.05)
Forward roll	4.15	3.45	4.89	Function in favour of the experimental
Backward roll	3.95	3.30	4.22	Function in favour of the experimental
Handstand	3.60	2.80	4.51	Function for experimental purposes
Headstand	3.70	2.85	4.33	Function in favour of the experimental group

The results in Table 3 show that the experimental group outperformed the control group in the post-test for all skills, with statistically significant differences at the 0.05 level, which confirms the validity of the third research hypothesis.

DISCUSSION

The experimental group's superiority in the four skills:

The superiority of the experimental group is attributed to a number of factors associated with the nature of cooperative learning, most notably: the higher level of intrinsic motivation among students working in groups; the availability of immediate peer feedback, which facilitates the correction of motor errors before they become ingrained; and the sense of collective responsibility that drives each student to exert their utmost effort (Al-Alawi, Muhammad Hassan, 2001, p. 77).

The role of social interaction in motor acquisition:

The results of this research demonstrated that social interaction among students within cooperative groups represents a factor that enhances motor learning no less important than individual practice itself. It allows students to observe multiple models of skill performance from their peers, which enriches their motor repertoire and deepens their structural understanding of movement (Ratib, Osama Kamel, 1999, p. 141).

Limitations of the traditional approach:

Although the control group achieved a noticeable improvement, its results remained lower than those of the experimental group in all skills. The researcher attributes this to the fact that the traditional approach focuses on the teacher as the centre of the educational process, reduces the time available for students' actual practice, and overlooks the role of horizontal interaction among learners (Al-Rabie, Mahmoud Daoud, 2011, p. 261).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The cooperative learning approach proved highly effective in developing the level of floor gymnastics skills acquisition among second-year students at Al-Nusoor University, as the experimental group outperformed the control group in all four selected skills.
2. The control group, which followed the traditional method, achieved an improvement in their performance level; however, this remained below the level achieved by the experimental group in the post-test.
3. The group interaction and peer feedback facilitated by the cooperative learning approach are key factors in accelerating the acquisition of fine motor skills.
4. The cooperative learning approach helps to alleviate students' fear and hesitation towards learning acrobatic floor gymnastics skills, thanks to the mutual support among group members.
5. All three hypotheses formulated by the researcher were confirmed, supporting the use of cooperative learning as a methodological alternative to the traditional approach to teaching floor gymnastics.

Recommendations

1. The researcher recommends adopting the cooperative learning approach in teaching floor gymnastics to second-year students in physical education faculties as an effective alternative to the traditional approach.
2. Revising the termly teaching plans for gymnastics and incorporating a variety of teaching methods rather than limiting them to the American method.
3. Conducting similar studies covering other academic levels and different gymnastics activities, such as apparatus gymnastics, to verify the generalisability of this research's findings.
4. Train teaching staff in physical education faculties to employ cooperative learning strategies and provide them with practical guidance manuals.
5. Conducting future studies examining the impact of cooperative learning on psychological variables associated with gymnastics learning, such as self-confidence and fear of injury.

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