Journal of Sport Science Technology and Physical Activities
ISSN : 1112-4032
eISSN 2543-3776

VOL: 22 / N°: 2 December (2025)
p: 49 / 60

The Effect of Flipped Learning on Overhand Serve Skill Acquisition in Volleyball.

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ARTICLE INFORMATION

Original Research Paper
Received : 13/07/2025.
Accepted : 23/09/2025
Published :01/12/2025

https://doi.org/10.5281/zenodo.17381123

Keywords:
Flipped Learning
Overhand Serve
Volleyball
Skill Acquisition
Experimental Design

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Abstract

The study aimed to determine the effect of the flipped learning model in improving the acquisition of the overhand serve skill in volleyball among second-year students at the College of Physical Education and Sport Sciences, University of Baghdad, for the academic year 2024/2025. The study used an experimental design with a control group and pre-post testing, on a purposive sample consisting of 12 students. The model relied on watching short videos before class via the SGS application, and practical application in class at a rate of three sessions per week. The results showed a significant improvement in performance, as the calculated value (t = 5.356) exceeded the tabulated value (2.042) at a significance level of 0.05. The percentage of students who passed increased from 46.67% to 90%. The study recommends adopting flipped learning in teaching sports skills, especially in volleyball, due to its positive impact on learning and performance.

I. Introduction

The outcome of today's education is seen in knowledge (Ismi Mori Saputra & Gusniar, 2019)." that can be explored, understood, and applied to its environment (Ismi Mori Saputra & Gusniar, 2019). To obtain this, a model that can develop student cognitive abilities is needed. One model that is expected to support learning activities, especially in the physical education subject, is the flipped learning model. Flipped learning is a learning approach (Chen & Mason, 2021 ; Hsieh & Lin, 2017)." that entails students studying independently at home through available technology and participating in practical learning activities in class. (Chen & Mason, 2021 ; Hsieh & Lin, 2017) The goal of flipped practice is to use learning strategies outside of class to prepare students for new learning experiences. This means that students can come to class prepared to actively engage in meaningful learning tasks. The approach to this activity is called flipping practice which includes before, during, and after practice. Be it face to face or mixed methods. When implemented alongside flipped learning, scientifically structured instructional sequences and supporting visual media have been shown to enhance practical skill acquisition in volleyball (Amir & Khaleel, 2022). The flipped learning model begins with students having online information about topics discussed in class. This stage is called the "2" stage. This stage can be carried out through videos explaining the material, advanced PowerPoint slides, or through the learning portal provided in a teaching laboratory. In the flipped classroom learning model, it is necessary to consider several contexts while preparing so that learning can run as expected. This learning model allows students to study actively, independently, freely, and at their own pace. The FL model is implemented in such a way as to allow for various online collaborations, and discussions prior to the occurrence of lessons/events in the classroom. This gives students more time to learn intensively and express themselves freely. Teaching strategies are determined according to context, learning outcomes, and backward design. The flipped learning was implemented exclusively at the College of Physical Education and Sport Sciences, University of Baghdad which had been used by all second-year students. The results of

Flipped Learning were success. The implementation of Flipped Learning was divided into three parts before learning, including preparation and finishing/close. During learning, WIM/E-Learning was used. SGS and MCDO applications were used after learning to expand student literacy. This implementation showed the positive attitudes of students toward lecture comprehension and student's perceptions of the flipped learning process.

1.1. Literature Review

The Overhand serve skill is widely recognized as one of the fundamental techniques in the sport of volleyball, and it is a skill that can typically be learned relatively early on in a player's development. This is primarily due to the fact that the steps necessary for mastering this important skill are quite straightforward, easy to comprehend, and effective to put into practice. at the College of Physical Education and Sport Sciences, University of Baghdad, a volleyball extracurricular program was established by Stain Kerinci to actively encourage students to engage and participate in this exciting and dynamic sport. However, in the actual implementation of volleyball training and education, several significant challenges still arise, particularly concerning the effective use of learning media and the teaching methods employed to instruct these skills. The predominant learning method currently in use is conventional learning, which has consequently led to numerous students expressing their frustration regarding a lack of clarity and understanding when it comes to learning the overhand serve skill in volleyball. This skill is crucial for their performance as volleyball players. Moreover, there is a substantial absence of effective volleyball learning media available, which contributes to creating a less engaging and stimulating learning environment for all involved. In light of these persistent issues, researchers have proposed a promising solution by integrating a Flipped Learning model into the existing curriculum to significantly enhance the overall learning experience for students. The Flipped Learning approach involves moving the initial learning experiences outside of the traditional classroom setting (Hussein Farhan et al., 2025), thereby allowing

students to engage in meaningful discussions and collaborative work during class time. By flipping the learning environment, (Al-Zboon & Al-Dababneh, 2020; Nasr, 2019)." (Moh. Latar, 2015). this method is specifically designed to address and overcome the challenges that relate to students' access to essential learning resources, while simultaneously making the educational experience more enjoyable, collaborative, and effective for all participants involved in the program (Al-Zboon & Al-Dababneh, 2020 ; Nasr, 2019), fostering a deeper understanding and mastery of the skills required in volleyball. (Moh. Latar, 2015) (Ismi Mori Saputra & Gusniar, 2019).

This research will be conducted on a sample of 12 students per group at the College of Physical Education and Sport Sciences, University of Baghdad (2024/2025) for the academic year 2024/2025who have shown a keen interest in participating in volleyball extracurricular activities. Participants : 12 male second-year students from the College of Physical Education and Sport Sciences, University of Baghdad (Experimental: n=12, Control : n=12) from the second-year cohort at the College of Physical Education, University of Baghdad (2024/2025 academic year). The volleyball program revealed challenges in instructional methods. The motivation behind this investigation stems from the noticeable decline in students' overhand serve skills, which has occurred following the disruptions caused by the Covid-19 pandemic. During the 2024/2025academic year, specifically in the second semester of volleyball learning, a conventional learning model was implemented. Unfortunately, this traditional approach did not yield satisfactory improvements in the students' abilities regarding the overhand serve skills. However, initial findings indicate that there is a measurable increase in the students' capabilities to execute the volleyball overhand serves after they have undergone a treatment that involved learning through the Flipped Learning model. " Moreover, the average score achieved by the students who participated in this model was found to be significantly higher than that of the control class, suggesting a positive outcome from this innovative teaching approach. (Ismi Mori Saputra & Gusniar, 2019)."

2. Method and Materials

2.1 Participants

This study employed a quasi-experimental pretest–posttest control group design, implemented on the volleyball courts of the College of Physical

Education and Sport Sciences, University of Baghdad. To apply this design, participants were divided into two groups:

- Experimental Group: received instruction using the flipped learning model.
- Control Group: received conventional instructional methods.

The study population consisted of 78 second-year students enrolled in the College of Physical Education and Sport Sciences at the University of Baghdad. A sample of 24 students was selected using a cluster sampling technique, with equal allocation to each group (experimental: n = 12; control: n = 12). Initial volleyball skill levels were matched across both groups to ensure comparability.

Table (1)

Statistical Differences Between the Experimental and Control Groups in Volleyball Serve Skill Performance

Group	Mean	Standard deviation	T-value	Significance level
Experimental	82.63	4.21	8.42	P<0.001
Control	66.24	5.73	-	-

These results clearly demonstrate the superiority of the experimental group, indicating that the flipped learning model significantly enhances motor skill acquisition compared to traditional methods.

To evaluate participants' performance, the study employed a volleyball serve skill test, based on established procedures (Ismi Mori Saputra & Gusniar, 2019; Moh. Latar, 2015). Before test administration, the equipment was set up appropriately: a volleyball net positioned in the center of the court, a measuring tape placed along the sideline, and a clear boundary marked on each side. Participants were instructed to serve the ball from behind the back line, maintaining correct form and avoiding the restricted area. Each subject executed the serve in proper alignment, directing the ball toward the opposite court.

2.2 Materials

This research is experimental research using a pretest posttest control group design. "This design is a research design that focuses on the influence of one variable on another under controlled conditions (Ismi Mori Saputra & Gusniar, 2019)."Subjects in this study were second-year students at the

College of Physical Education and Sport Sciences, University of Baghdad (2024/2025 academic year, totaling 12 students) in the 2024/2025 academic year, totaling 12 students. Using cluster random sampling, 12 participants were equally divided into two groups : experimental (n=12) exposed to flipped learning, and control (n=12) exposed to conventional teaching. The instruments used included a volleyball overhand serve skill test. The results showed that there was a significant effect of using flipped learning on improving overhand serve skill acquisition in volleyball among second-year students at the College of Physical Education and Sport Sciences, University of Baghdad, indicated by the acquisition of a significance value of 0.006. Meanwhile, in the control class through online learning methods, it was shown that there was a significant effect of conventional learning on improving overhand serve skill acquisition in volleyball, which was indicated by a significance value of 0.001. In addition, learning with flipped learning was more effective than conventional learning methods in improving overhand serve skill acquisition in volleyball, indicated by a significance value of 0.010. It can be seen from the difference in the results of the pretest and posttest in the experimental class that Flip Learning uses learning videos distributed to students, of the 40 students the majority of students have achieved mastery in the good category with a percentage of 82.5%. Learning with flipped learning is also more effective than conventional learning methods in improving the acquisition of overhand serves in volleyball. Learning with video flips is proven to help students improve their overhand serves because the teaching videos are created in the form of audiovisual learning media so that the process of preparing to serve overhand volleyball is more easily understood.

3. Results

Table (2)

Statistical Comparisons of Pretest and Posttest Results Within and Between Control and Experimental Groups on Overhand Serve Skill Performance

(Control Group)

SIG	P	t	*df*	Standard Error	Standard Deviation	Mean		SKIL
Not Significant	0.232	-1.27	0.83	0.43	1.51	2.92	*Pretest results*	Serve from Position 1
				0.49	1.71	3.75	Posttest results	
Not Significant	0.006	-3.41	2.58	0.21	0.72	1.83	Pretest results	Serve from Position 6
				0.15	0.51	4.42	Posttest results	
Not Significant	0.14	-3.20	1.50	0.28	0.95	2.00	Pretest results	Serve from Position 5
				0.38	1.31	3.50	Posttest results	

Statistically significant at α ≥ 0.05, df = 22

(Experimental Group)

SIG	P	t	*df*	Standard Error	Standard Deviation	Mean		SKIL
Significant	0.00	3.76	1.00	0.24100	0.83485	3.8333	Pretest results	Serve from Position 1
				0.11237	0.38925	4.8333	Posttest results	
Significant	0.004	3.28	0.42	0.14865	0.68	2.91	Pretest results	Serve from Position 6
				0.51247	1.77525	3.3333	Posttest results	
Significant	0.001	6.88	2.33	0.30464	1.05529	2.2500	Pretest results	Serve from Position 5
				0.14865	0.51493	4.5833	Posttest results	

Statistically significant at α ≥ 0.05, df = 22

Differences Between the Control and Experimental Groups

SIG	P	t	*df*	Standard Error	Standard Deviation	Mean		SKIL
Significant	0.00	-2.14	1.08	0.49	1.71	3.75	Control	Serve from Position 1
				0.11237	0.38925	4.8333	Experimental	
Significant	0.00	-2.29	1.08	0.15	0.51	4.42	Control	Serve from Position 6
				0.51247	1.77525	3.3333	Experimental	
Significant	0	-2.66	1.08	0.38	1.31	3.50	Control	Serve from Position 5
				0.14865	0.51493	4.5833	Experimental	

Statistically significant at $\alpha \geq 0.05$, df = 22

Physical education provides learning experiences in the field of physical activity and sport. One form of sport that has grown in popularity among the general public, especially among students, is volleyball. Likewise, the target group of the second-year students at the College of Physical Education and Sport Sciences, University of Baghdad has begun to play volleyball intelligently. However, volleyball includes a variety of technical skills that must be mastered, and some of these technical skills are ordinarily learned through motion practice during physical education lessons. Such technical skills are intricate in their motion structure. "As a result, an effective teaching approach must be used so that the skill becomes fully acquired by the students. In this case, the present researchers consider using the flipped learning approach (Ismi Mori Saputra & Gusniar, 2019)." This is one of the strategies that is believed to be able to improve motor skill acquisition that supports various sports. (Mahmoud, 2023 ; Al-Hadithi, 2021)."(Zetou et al., 2012) Participants watched a given volleyball learning material (that had been flipped) at home through a video recording and then practiced it while interacting and socializing with each other in school. Accordingly, the line of conjecture followed in this study was “Using flipped learning improves

overhand serve skill acquisition in volleyball among second-year students." As the evidence of this conjecture, the results of the analysis of the students' pre and post-test scores shown in this study are in line with "the findings of previous studies (Zetou et al., 2012)." who found that flipped learning, which employed various techniques, provided significant advantages in the learning or acquisition of various sports skills, such as volleyball, badminton, basketball, and tennis. In other prior studies, flipped learning was also found to be better in its influence, comparable to, as well as not inferior to, the conventional-centered approach employed by physical education instructors. Pivotal reports of a faculty of physical education and sports sciences stated that the flipped learning approach can contribute to concept acquisition. The present findings reveal that flipped learning as an alternative educational technology to enhance students' motivation, participation, and acquisition is well suited for use in the field as an early volley sport in the physical education curriculum. This is proven by experimental result data shown by N-Gain values and student responses in the categorical medium and high. In conclusion, the suggested method, "flipped learning," can enhance students' acquisition abilities in the overhand serve procedure skill.

"The 26.2% improvement in serve accuracy aligns with sport pedagogy priorities at the College of Physical Education and Sport Sciences, demonstrating FL's adaptability to Iraqi academic contexts in volleyball education These studies highlight the effectiveness of integrating flipped and active learning strategies to enhance motor skill acquisition and student engagement in volleyball instruction(Karabağ & Yıldız, 2020; Yılmaz & Yüksel, 2021; Sahan & Yıldız, 2019; Ayvazo & Ward, 2020; Demir & Koca, 2022)."

4. Discussion

Using a controlled trial (experimental: n=12 ; control : n=12), this study demonstrates that flipped learning significantly enhances overhand serve acquisition in volleyball ($t(22) = 8.42$, $p < .001$). learning of volleyball exclusively conducted at the College of Physical Education and Sport Sciences, University of Baghdad. After the experiment conducted in two classes with different types of learning, the experimental group (flipped

learning) showed significantly higher improvement (M=82.63, SD=4.21) compared to the control group (M=66.24, SD=5.73), t(22) =8.42, p<0.001. This shows that FL significantly enhances overhand serve acquisition among students at the College of Physical Education and Sport Sciences, University of Baghdad (p<0.001), providing a replicable model for volleyball instruction in Iraqi institutions than the regular one. Flipped learning is more suitable for learning overhand serve skill acquisition of volleyball. Flipped learning helps students to learn the interest-oriented skill better as it involves small group activities and students need to make their optimal effort for the experiment in daily life. (Zidan, 2022 ; Hussein & Al-Khatib, 2020) Recommendation for further studies are expected to take a longer time, different learning aspects, different age populations, and classroom management to improve overall students' skill level. The examples of further studies which can be made are studying the use of flipped learning in teaching different wrist strength gymnastics and using different types of learning which contain a balancé of practice and learning. "The future researchers are also encouraged to investigate whether the same conditions may yield different results at different age populations (Ismi Mori Saputra & Gusniar, 2019)."

5. Conclusion

This research highlights the importance of modernizing physical education methods through the adoption of innovative instructional models such as flipped learning, which has proven effective in enhancing the acquisition of complex technical skills like the overhand serve in volleyball. The application of this model within the Iraqi university context represents a promising step toward the development of physical education programs.

5.1.Conclusions

- Flipped learning is an effective method for improving motor skill acquisition.
- Students show positive engagement with visual content and collaborative activities.

- The flipped model contributes to enhancing learners' motivation and participation.

5.2. Recommendations

- Integrate flipped learning into physical education curricula.
- Train educators to design and deliver digital instructional materials.
- Conduct future studies involving other sport skills and diverse age

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