

Enhancing volleyball skills development for first- and second-year students at Thai Nguyen University of Technology

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Abstract

This study evaluates a 10-week volleyball training program for first- and second-year students at Thai Nguyen University of Technology. The programme is held twice in a 150-minute meeting and aims to improve technical skills (service, passing, setting, strategy) and promote commitment through progressive exercise and collaborative learning. Sixty students were involved in the semi-experimental design with pre- and post-intervention assessments. The results showed significant improvements in all skills. This gave me the greatest benefit from passing consistency, and increased motivation, confidence and enjoyment. Teamwork and trust presented qualitative knowledge as an important topic. The orientation of the program with Vietnam's collectivist culture has strengthened its effectiveness. This study highlights the value of TaylorMade sports programs in university formations and provides a model for resource-related institutions. The results address the Culturally Responsive-Quick Curriculum to promote student wells and lifelong physical activity.

Keywords: *Volleyball training, physical education, collaborative learning, beginners, University*

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I. Introduction

Volleyball as a dynamic and dedicated sport plays an important role in the curriculum for physical education curriculum (PE) around the world, promoting physical fitness, teamwork and mental wells among students. At Thai Nguyen University of Technology (TNUT), Thailand, volleyball is a central component of the PE programme for first and second year students, with many beginners being limited to exposure to sports. These students, ages 18 to 20, come from a variety of academic backgrounds in the university's technical and technical fields that help counterweights that physical activity is important for sitting academic routines. Inclusion of volleyball in the curriculum not only promotes physical health, but also promotes essential soft skills such as communication, cooperation, and strategic thinking, and can be transferred to both academic and professional contexts.

Despite its advantages, beginner education in a university setting offers volleyball for unique challenges. Many TNUT students lack basic skills such as serving, passing, and set, which may be threatened by the technical and coordinated requirements of the sport. Furthermore, all size fits often pursued in PE classes lead to inability to tackle the various skills and learning of students, leading to deposits and suboptimal development. This issue is particularly prominent in the Vietnam University context, with PE being underestimated compared to academic disciplines, and TaylorMade sports programs are limited. As a result, there is an urgent need for a structured, evidence-based volleyball training programme in beginners while encouraging motivation and long-term participation.

This study aims to address these challenges by designing and evaluating volleyball training programs tailored to first and second year TNUT students. The program focuses on developing progressive skills, including collaborative learning strategies and culturally relevant teaching methods to improve commitment. My main goal is twice.

(1) is to improve the technical volleyball ability of students, including serving, existing, setting, and basic gaming strategies, and (2) to increase motivation and trust among students participating in volleyball activities. By addressing these goals, this study aims to contribute to a broader discourse on effective PE pedagogy in the formation of technology universities, where physical activity can significantly improve student well-being.

The importance of this study lies in the potential to inform the PE curriculum design of TNUT and similar institutions. A well-structured volleyball programme can serve as a model for other sports, promoting student health and commitment, while also meeting the university's mission to develop rounded alumni. Furthermore, this study responds to the emphasis on overall education in Vietnam, where physical and mental health is increasingly recognized as essential for academic success. Because it focuses on beginners in cultural contexts, this study

closes the literature gap and provides practical recommendations for PE teachers and administrators who want to optimize sports education in a university setting.

Volleyball Training and Physical Education literature provides a robust foundation for designing effective programs for beginners. Volleyball training methods emphasize progressive acquisition of skills, starting with basic techniques such as serving, setting, setting, and peaking before proceeding with complex game strategies (Gabbett et al., 2006). For beginners, we will look at how important it is to divide these skills into manageable components using exercises that prioritize repetition and feedback to build muscle memory and trust (O'Sullivan, 2013). Cooperative learning strategies in which students work in pairs or small groups for skill practice have proven effective in improving commitment and promoting teamwork (Dyson & Casey, 2016).

In the context of university formation, sports programs serve as an important way to promote health and student wells. Research shows that university students, particularly in the field of technology, often suffer from high stress and physical inactivity, in order to require academic schedules (Keating et al., 2005). Volleyball, with moderate aerobic requirements and a focus on social interaction, is a good choice for mastering these tasks. A study by Smith and Lee (2020) showed that structured PE programs, including team sports such as volleyball, physical fitness, mental health, and the sense of belonging to students, are significantly improved. However, the effectiveness of such programs depends on the agreement between student skills and cultural preferences that differ from region to region and institution.

In Southeast Asia, including Vietnam, PEs stand in university organizations with unique challenges with limited resources, large class sizes and cultural emphasis on physical activity academic achievement (Nguyen & Tran, 2018). Research dedicated to Vietnam highlights the need for PE programs that are accessible, dedicated and tailored to the local student population. For example, Tran et al. (2021) students at the University of Vietnam found that these approaches responded positively to sports programs that included cooperatives and play-based learning as they agreed on the cultural values of collectivism. However, there is a lack of research into volleyball-specific interventions at universities in Vietnam, especially for beginners with minimal prior experience.

The gap in the literature exists in relation to the integration of culturally relevant pedagogy in volleyball training. Global research provides general framework conditions for skill development but often overlooks the institutional and cultural nuances of non-western environments. For example, Thai University of Technology serves student organizations primarily in Vietnam from different socioeconomic backgrounds that may affect access to sports facilities and previous combat. Additionally, for short periods of PE classes (usually 90 minutes per session), there is a need for efficient and highly effective training methods that maximize the acquisition of skills within the time limit.

This study is based on existing research by adapting the principles of global volleyball training to the specific needs of TNUT students. By including cooperative learning, progressive exercises and culturally sensitive educational strategies, the proposed programmed aims to address the identified gaps and provide a model for effective volleyball training in the formation of the University of Vietnam. This literature highlights the possibility of such interventions to improve not only technical skills, but also improves student commitment and wealthy presence, and agrees with the broader goals of overall training.

II. Methodology

This study uses a semi-experimental research design to assess the effectiveness of a tailored volleyball training program for the first and the second year students at the Thai Nu Nguyen University of Technology (TNUT). The design includes pre- and post-reviews of interventions to measure improvements in technical volleyball ability and student engagement. This methodology is structured to address research goals:

Improve basic volleyball skills (service, passing, setting, and basic game strategies) and improve students' motivations and trust in culturally relevant contexts.

Participants

This study included 60 students in their first and second years (18-20 years, mixed gender) enrolled in the TNUT Physical Education Program (PE). Participants are selected using sampling of two intact PE classes to ensure a diverse representation of academic majors in the technical and technical fields of the university. All participants are beginners with minimal experience in advance volleyball, which is defined more than formal training or competitive games for less than a year. Declaration of consent and ethical approval from the TNUT Institutional Review Board obtained to ensure compliance with research standards.

Intervention

The intervention consists of a 10-week volleyball training programmed that takes place twice a week in a 150-minute meeting in a regular PE class. The program is based on progressive principles of skills and cooperative learning strategies tailored to the needs of beginners in a university environment in Vietnam. Each session includes

Warm-up (15 minutes): Dynamic routes and lightweight exercises to physically prepare students.

Skill-centric exercises (110 minutes): consists of progressive exercises (e.g. forearm path consistency), settings (e.g. 3V3 mini turtle positioning, etc.) aimed at servings (e.g. underwire accuracy). The exercise emphasizes repetition, feedback and peer cooperation to build trust and competence.

Cooling and Reflection (25 minutes): Stretch and Short Group Discussion Enhance learning and promote teams. The program includes culturally relevant elements, such as B. group-based activities organized in Vietnamese collectivist values, and is provided by researchers who are PE instructors trained to ensure consistency.

Data Collection

Data are collected using an approach with mixed methods to record both quantitative and qualitative results:

Completed Evaluation: Procest and new intervention tests measure technical skills using standardized sections. For example, the accuracy of a service is assessed by the number of successful services in a designated judicial area (from 10 experiments), and existing consistency is assessed by the success of the path to the partner (from 10). The assessment is performed by two trained PE trainers to ensure reliability between conditions.

Engagement Survey: The pre- and post-intervention surveys adapted to

Smith and Lee (2020) measure student motivation, trust, and enjoyment on a 5-point Likert scale (1 = strong, 5 = consent). Open questions document qualitative insights into students' experiences and preferences.

Data Analysis

Quantitative data from the skill assessment are analyzed using paired t-tests to compare performance before and after the intervention with statistical significance set for $P < 0.05$. The survey analyzes the response and mean of Likert scale measurements, but open answers undergo thematic analysis to identify repetitive topics (teamwork, fun, etc.). Triangulation of data data ensures a robust interpretation of the development of skills and commitment outcomes.

Limitations

Potential limitations include low sample size, individual institutional focus, and trust in self-report commitment data that can introduce distortions. These are reduced through rigorous assessment protocols and transparent reporting.

III. Results and discussion

Twice a week in a 150-minute meeting, the 10-week volleyball training program at Thai Nu Nguyen University (TNUT) has brought about significant improvements in technical skills and commitment among 60 students in their first and second years. This quasi-experimental study used pre- and post-intervention assessments to assess skills to assess services, presence, setting, and basic gaming strategies supplemented by research to measure motivation, confidence, and enjoyment. The results are organized from quantitative results from qualification reviews and qualitative knowledge from commitment surveys, demonstrating the effectiveness of the programme for beginner players.

The quantitative results revealed substantial skill improvements across all assessed domains. For serving accuracy, the pre-intervention mean score was 3.8 (SD = 1.2), which increased to 6.4 (SD = 1.0) post-intervention ($t(59) = 12.10$, $p < 0.001$). This indicates that students significantly enhanced their ability to land underhand serves in a designated court zone, with 83% achieving at least six successful serves post-intervention compared to 30% pre-intervention. Passing consistency also improved markedly, with the mean score rising from 4.2 (SD = 1.3) to 7.0 (SD = 0.9) ($t(59) = 13.45$, $p < 0.001$). Post-intervention, 76% of students completed at least seven successful forearm passes to a partner, up from 25% pre-intervention. Setting proficiency saw a similar trend, with the mean score increasing from 3.5 (SD = 1.4) to 6.2 (SD = 1.1) ($t(59) = 11.65$, $p < 0.001$), reflecting improved hand positioning and control. In terms of game strategy application, assessed through 3v3 mini-games, the mean score rose from 4.0 (SD = 1.5) to 6.7 (SD = 1.0) ($t(59) = 10.20$, $p < 0.001$), with 73% of students demonstrating correct court positioning post-intervention compared to 28% pre-intervention. These results suggest that the 10-week program effectively developed technical proficiency, with passing showing the largest mean increase (2.8 points) and setting the smallest (2.7 points). No significant gender differences were observed in skill improvements ($p > 0.05$), indicating the program's broad applicability.

The qualitative findings from engagement surveys further underscored the program's impact. On a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), motivation to play volleyball increased from a mean of 3.2 (SD = 0.8) to 4.2 (SD = 0.6), confidence in volleyball skills rose from 2.9 (SD = 0.9) to 4.0 (SD = 0.7), and enjoyment of volleyball classes improved from 3.4 (SD = 0.7) to 4.4 (SD = 0.5). Thematic analysis of open-ended responses revealed a strong sense of teamwork, with students appreciating cooperative drills for making learning enjoyable and less intimidating. Many expressed increased confidence, noting that they overcame initial fears of performing skills like serving. Additionally, several students indicated a desire to continue playing volleyball, suggesting the program fostered sustained interest. These qualitative insights align with the quantitative data, highlighting the program's success in enhancing both skill acquisition and positive affective outcomes.

The results of this study confirm the effectiveness of a 10-week volleyball training program twice a week, 150 minutes, to improve technical skills and commitment to TNUT beginners. The key benefits in the use of serving, passing, setting, and playing strategies correspond to studies that emphasize progressive and qualified training for beginners (Gabbett et al., 2006). The success of the program is based on its structured approach, complex skills for manageable exercises, and simplifying the use of cooperative learning and promoting peer support and motivation (Dyson & Casey, 2016). Despite the shorter 10-week period compared to similar interventions, the expanded 150-minute meeting allowed sufficient time for practice and reflection on skills that contributed to robust outcomes.

Quantitative findings show that students achieved significant developments in skills in all areas measured. The notable improvement in the handover of consistency is probably reflected in the focus of the program that repeats the forearm passport exercises that are more fundamentally and technically more demanding than the setting. The slightly lower benefit in knowledge decisions can be attributed to his requirements for accurate hand adjustments, which may benefit from additional practice times. The improved ability to apply game strategies in mini-games indicates that students have surpassed isolated skills in order to capture basic tactical concepts, an important milestone for beginners. These results are particularly encouraging considering the condensed 10-week time frame. This shows that a well-designed, intensive session can achieve critical acquisition of skills.

Qualitative findings showing that motivation, self-confidence, and joy emphasize program orientation with student-centered pedagogy. The emphasis on teamwork was on Vietnamese collectivist culture, where group-based activities improve commitment (Tran et al., 2021). Reported student trust growth is a significant outcome as self-efficacy applies ongoing sports participation (O'Sullivan, 2013). The ongoing interest in volleyball participation identifies the potential of programs to promote lifelong physical activity, a critical goal of university PE programs dealing with academic lifestyles.

Compared to existing literature, this study has increased the value of structured PE programs in the formation of universities (Smith & Lee, 2020). In contrast to many studies focused on mixed-skill groups, this intervention was aimed at beginners and closed the gap in beginner-specific volleyball training. The use of cooperative learning is a traditional teacher-oriented approach that is widely used in Vietnam PE and Tran et al. (2021) was directed at ways to respond culturally. The 150-minute meeting is longer than a typical PE class, but it maximized skill-group interaction and reduced overall duration.

The practical implications of this study are important for PE educators. Teachers should prioritize progressive exercises, build basic skills and ensure accessibility for beginners. Cooperative learning strategies such as peer exercise and mini-games can improve commitment, especially in collectivist cultures such as Vietnam. A long session period of 150 minutes has proven to be effective. This indicates that the university should be considered prepared as given enough time. These approaches can be adapted to other sports and institutions, particularly technology universities, which are PE counters for academic stress.

Culturally, the program used Vietnamese collectivist values through group-based activities and promoted a supportive learning environment. Minimal equipment requirements ensured accessibility for students from a variety of socioeconomic backgrounds. This deals with resource restrictions common at universities in Vietnam. Future programs should maintain this cultural and practical orientation to maximize effectiveness.

Compared to the existing literature, this study has increased the value of structured PE programs in the formation of universities (Smith & Lee, 2020). In contrast to many studies focused on groups with mixed sources, this intervention was beginner-oriented and closed the gap in beginner-specific volleyball training. The use of collaborative learning is a traditional teacher-oriented approach, with Vietnamese PE and Tran et al. (2021) were instructed to respond culturally. The 150-minute meeting is longer than the typical PE class, but maximized the interaction between capacity groups and overall duration reduction.

The practical implications of this study are important for PE educators. Teachers need to prioritize advanced exercises, build basic skills and ensure accessibility for beginners. Cooperative learning strategies such as peer training and mini-games can improve commitment, especially in collectivist cultures such as Vietnam. Long session times of 150 minutes have proven effective. This indicates that college should be created with ample time. These approaches can be adapted to other sports and institutions, particularly at the University of Technology, a PE counter for academic stress.

Each group-based activity used Vietnamese collectivist values culturally to promote a supportive learning environment. Minimum equipment requirements ensured accessibility for students from a variety of socioeconomic backgrounds. This deals with resource limitations that are common in Vietnamese universities. Future programs should maintain this cultural and practical orientation to maximize effectiveness.

The study's limitations include its small sample size and single-institution focus, which limit generalizability. The 10-week duration, while effective, may not capture long-term skill retention. Self-reported survey data risks bias, though triangulation with skill assessments strengthens validity. The absence of a control group, due to logistical constraints, tempers causal claims, but the pre-post design provides compelling evidence of improvement.

Future research should investigate longitudinal effects to assess skill retention and sustained engagement. Multi-institutional studies could enhance generalizability across Vietnam's urban and rural universities. Exploring advanced skills, such as spiking, for progressing students could refine the curriculum. Comparing cooperative versus individual learning approaches could further clarify their effectiveness in culturally specific contexts.

In conclusion, the 10-week volleyball training program, with 150-minute sessions, significantly improved technical skills and engagement among TNUT students. By integrating progressive drills, cooperative learning, and cultural sensitivity, it offers a model for effective PE in higher education. These findings advocate for student-centered, culturally responsive PE programs to support holistic student development.

IV. Conclusion

The 10-week volleyball training programme for 150 weeks twice per week improves technical skills and commitment between the first and second year students at Thai Nguyen University of Technology. There are significant improvements to show the success of the program in meeting the needs of beginners in terms of servings that occur, setting up game strategies, playing and motivation, and self-confidence and enjoyment. Through the integration of progressive exercise and cooperative learning, interventions promote skill acquisition, agree on harmonious Vietnamese collectivist cultural values, and create an integrated and supportive learning environment. These results highlight the important role of the TaylorMade Sports Program (PE) in promoting student wells, especially at technology universities where physical activity meets academic addictiveness. The accessibility of programs that require minimal equipment makes it a practical model for resource-related institutions. This study contributes to a culturally evidence base of response and provides educators with practical strategies to improve student development. Future research should consider long-term impacts and broader applications at the University of Vietnam. The university is encouraged to prioritize evidence-based PE curricula that promotes both physical competence and overall growth, and to ensure that students have dedicated and integrated sports programs for academic and personal success.

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