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Efficacy of Jigsaw learning in teaching volleyball skills to grade 12 students

Henreyna Jane C. Redublado¹, and Gino Gasang Sumalinog^{2*}

¹College of Teacher Education, Biliran Province State University, Philippines

²College of Teacher Education, Cebu Normal University, Philippines

*Corresponding author (sumalinogg@cnu.edu.ph)

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ABSTRACT

Playing volleyball is one of the Physical Education courses in the Philippines. However, playing it is not mastered due to a lack of research-based strategies. This study determined the efficacy of Jigsaw learning in teaching Volleyball in Grade 12 at Biliran Province State University-Main Campus, Naval, Biliran during the academic year 2022–2023 as a basis for a proposed skills enhancement activity. The study used a quantitative descriptive-correlation research design. There were one hundred (100) respondents. The skills performance of the students was good after using jigsaw learning in teaching volleyball as to, serving, passing, setting, spiking/attacking, and blocking. The students' skills performance before and after using jigsaw learning in teaching volleyball were significantly related. Jigsaw learning was efficient in teaching volleyball. Thus, the Jigsaw model is used to make the students more skillful and competent.

1. INTRODUCTION

One of the many group games taught in physical education and sports science colleges is volleyball. The game requires a variety of fundamental skills, some of which are offensive and some of which are defensive, like setting and spiking (Al-Zubaidi & Ali, 2024). Understanding how to organize and conduct volleyball drills was one of the course's learning objectives. As part of their education, they have to understand how to be a good role model for coaches (Moa et al., 2024). In Philippine schools, volleyball is a prominently taught sport, reflecting its popularity and importance in physical education programs.

DepEd Order No. 32, series 2017 (Department of Education, 2017) states that being physically fit is a must for leading an active and healthy life. Through an extensive physical fitness program and examination, the true growth of an individual's health components should be highlighted. Only

when they are strong and well-rested can the students provide their best effort. Therefore, to improve their general health and quality of life, students must actively participate in regular physical activities throughout their lives. The focus on volleyball seeks to enhance not only students' physical fitness but also their teamwork, discipline, and strategic thinking skills. Schools invest in skilled coaches and appropriate facilities to ensure that students receive quality training, which helps in identifying and nurturing potential athletes from a young age. This emphasis on volleyball contributes to a vibrant sports culture, fostering both recreational enjoyment and competitive excellence.

However, teaching volleyball to a group of students can be challenging for Physical Education teachers. According to Sgro et al. (2024), the dynamic and challenging sport of volleyball requires a combination of tactical and physical skills. Its dynamic setting necessitates strong perceptuomotor and cognitive demands during a game, making it an

open-skill sport. In volleyball, the fundamental moves are serve, pass, smash, and block. Without a doubt, all fundamental volleyball strategies have a significant impact and are crucial to getting the best outcomes. This volleyball game's skill technique is how you play and perform the match to accomplish goals quickly and effectively (Jafar et al., 2024; Gialogo & Gialogo, 2016). Teachers complain that students do not learn the skills without following a specific strategy. The skills that students need to learn are complex and they need effective strategies and techniques. Moreover, learning volleyball requires a strong social environment that can be enhanced through teamwork. Moa et al. (2024) stated that educators had to apply research-based teaching strategies that had been demonstrated to yield the greatest learning results as well. It could also be a tactic that entails analyzing and researching one's instruction. This reflective approach encourages teachers to improve their methods continuously and adapt to the evolving needs of their students. Additionally, by integrating evidence-based practices, educators can ensure that their teaching is both effective and efficient, leading to better educational outcomes. These strategies not only enhance student learning but also contribute to the professional growth of teachers.

One strategy in classroom learning is jigsaw. It is a cooperative learning method that was created and refined in the early days of education. Because volleyball is a team sport where players must cooperate, the jigsaw method might work. Using Jigsaw learning, each member of the group has a vital role to play in the intellectual or physical activity, which promotes listening, involvement, and empathy. To achieve a common objective, group members must cooperate as a cohesive unit. The jigsaw method of instruction fosters cooperation and mutual reliance among students. This method works well for completing several activities concurrently and instilling a stronger sense of personal accountability in students (Perwitasari et al., 2018).

Giving responsibility to each player should meet the volleyball objective of getting the ball to the other side of the court. Hence, teachers also have the responsibility of teaching volleyball by looking at various teaching styles to address the learning styles of the students. The students have different learning styles in acquiring the skills. Some students learn very fast, while others do not (Gialogo, 2016).

When a jigsaw is used in other fields, good results are obtained. It has been demonstrated that jigsaw learning works to boost students' self-esteem while also enhancing their performance, school satisfaction, and excitement for learning (Elliot & Patnoe, 2019). Students may assist one another with the task(s) at hand (Senaie et al., 2019; Karacop & Diken et al., 2017). The Jigsaw technique had a more favorable impact on students' overall mathematics achievement (Abed et al., 2019). Azmin (2016) highlighted that following the intervention, participants' performance improved noticeably, and they were enrolled using the jigsaw learning method. From a different study, Jigsaw learning has a stronger favorable correlation with students' skill performance (Reyes, 2013; Sumalinog, 2018a). Jigsaw was also successful in producing noticeably better results, which provided a solid basis for the participants to hone their creative thinking and problem-solving abilities (Yaayin et al., 2021; Fajria, 2022).

In a classroom setting, jigsaw has gained popularity and efficacy. Efficacy is the capacity to complete a task to an acceptable or anticipated level, especially in learning volleyball skills and applying them in actual games (Abao et al., 2023; Argate et al., 2024). The jigsaw strategy follows these steps: 1. Present the study plan and the subject matter; 2. Assign every student to a "home group" consisting of three to five peers who represent a variety of reading levels; 3. Assign each student a reading selection from a predetermined list.; 4. Form "expert groups" with students from various "home groups" who will read the same passage; 5. Provide a time management framework for every student, including the different components of the jigsaw task. Assist the "expert groups" in gathering data in their specific field by formulating important questions; 7. Provide the tools and materials required for every student to learn about their subjects and turn into "experts." Keep in mind that reading assignments should be at instructional levels suited for the students (90–95% reading); 8. Talk about the guidelines for getting back together as "home groups" and offer direction as each "expert" shares what they have learned. As a reference for arranging the experts' information report, create a summary chart or visual organizer for every "home group"; and 10. Remind kids that it is their responsibility to learn the materials from each other within their "home group" (WETA Washington, 2024; Sumalinog, 2018b).

The positive impact of Jigsaw as used in other fields has attracted positive results. Therefore, this strategy can work well when used in the area of Physical Education, specifically during the Senior High School students' learning of skills. The results of this study could encourage Physical Education teachers to try other cooperative learning approaches in learning skills required in team sports. Schools may also get the idea that an approach used in other disciplines may work in sports. Through this study, the students, in particular, would remember that exploring classroom strategies can help master skills in field sports.

2. STATEMENT OF THE PROBLEM

This study aimed to:

1. determine the skills performance of the students before using jigsaw learning in volleyball along serving, passing, setting, spiking/attacking, and blocking;
2. determine the performance of the learners after using jigsaw learning in volleyball based on the skills mentioned above; and
3. assess the significant difference in the skills performance before and after using jigsaw learning in teaching volleyball.

3. METHODS

3.1. Design

This paper employed a quantitative design using a descriptive-correlation research method. The

students were assessed through utilizing the rubric for the skills profile; serving, setting, passing, attacking, and blocking, and to determine the efficacy of jigsaw learning in teaching volleyball in Grade 12.

3.2. Environment

The study was carried out at Biliran Province State University (BiPSU), which is located at P, in the School of Teacher Education. Philippines - Inocentes Street, Naval, Biliran. The province's only elite public university that serves and develops students' knowledge, abilities, and attitudes while offering high-quality instruction. The six (6) programs offered by the School of Teacher Education (STED) have recently been awarded the Certificate of Program Compliance (COPC) in various areas of expertise. The School of Teacher Education is ISO Certified 9001: 2015 and has modern facilities. Additionally, it has accreditation from several organizations, including the University of the Philippines (AACUP), the Technical Skills and Development Authority (TESDA), the Commission on Higher Education (CHED), Det Norski Veritas (DNV), and Accrediting Association of Colleges.

3.3. Respondents

The respondents of this research were the Grade 12 students enrolled at the Laboratory High School of Biliran Province State University – Main, Naval, Biliran for School Year 2022-2023.

Table 1. Distribution of the respondents

Strand, Grade & Section	Male	Female	No. of Respondents	%
ABM 12-A	12	13	25	25
HUMSS 12-A	13	12	25	25
STEM 12-A	12	13	25	25
STEM 12-B	12	13	25	25
Total	49	51	100	100

Acronyms of the strands

ABM (Accountancy, Business, and Management)

HUMSS (Humanities and Social Sciences)

STEM (Science, Technology, Engineering, and Mathematics)

The respondents were drawn at random from among males and females in each of the various strands, as shown in Table 1. In total, one hundred (100) respondents took part in this study.

3.4. Instrument

A rubric was used in data collection and a 4-point rating system was used, with 4 representing the

highest rating and 1 representing the lowest. The skills of serving, passing, setting, spiking/attacking, and blocking were listed in the first column of the rubric. The researcher used this criterion to assess how well jigsaw learning worked when teaching volleyball to 12th Graders.

3.5. Flow of the study

As seen in Figure 1, the input, process, and output are used in this investigation. The input listed the performance of the following volleyball skills before and after utilizing jigsaw learning: serving, passing, setting, spiking/attacking, and blocking. The procedure that followed was the one listed in the second column. It included the mailing of

transmittal letters, the creation and use of rubrics, the collection of data, its tabulation and presentation, and its statistical analysis through the use of descriptive correlation analysis, weighted mean, and standard deviation. The results of this study were then utilized as the foundation for skill-building exercises while teaching volleyball to students in Grade 12, which was the product.

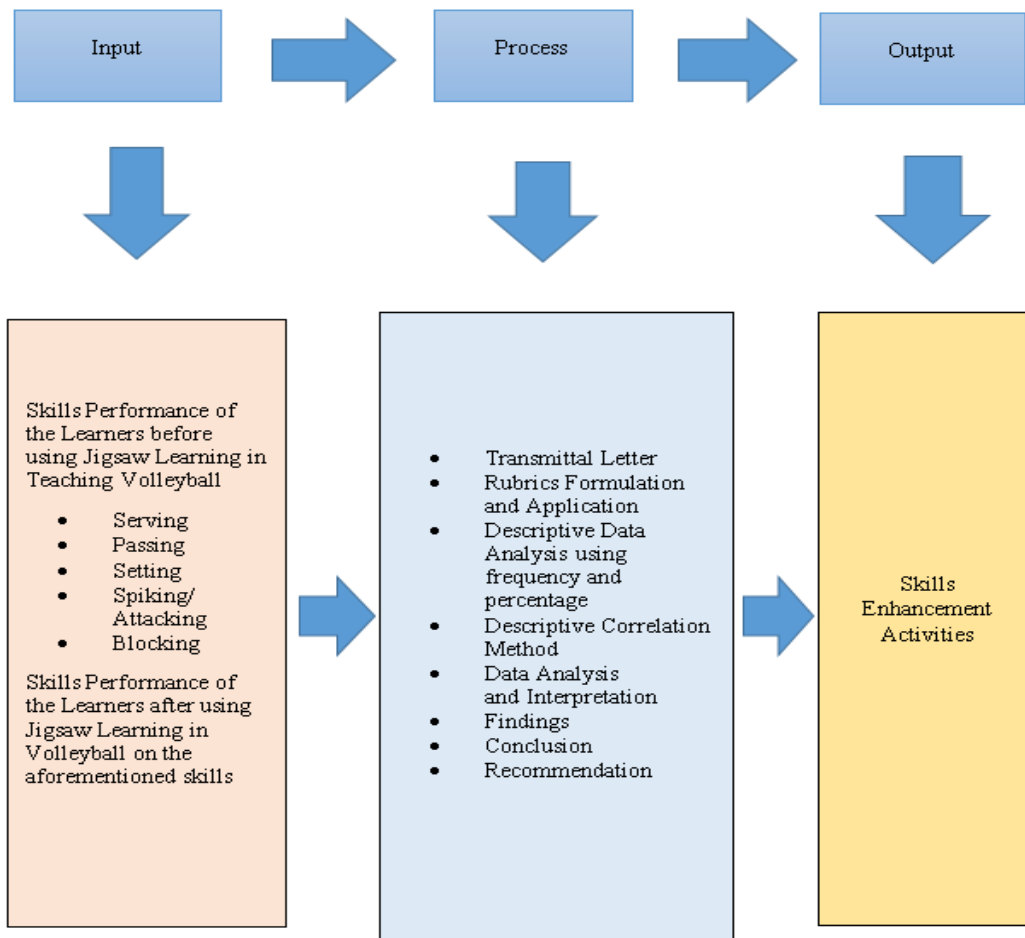


Figure 1. Flow of the study environment

3.6. Jigsaw implementation procedures

In teaching volleyball to Grade 12 students using the Jigsaw method, the approach was structured around the five fundamental volleyball skills: serving, passing, setting, spiking, and blocking. Initially, during the pre-test phase, traditional lecture-based instruction was used. The instructor provided handouts and demonstrated the skills through a plain discussion without active student participation. For the post-test phase, the Jigsaw method was employed. The instructor identified five students

who excelled in each of the specific volleyball skills. These students became the leaders of five groups, each focusing on one skill: serving, passing, setting, spiking, and blocking. Each group was tasked with mastering their assigned skill through cooperative learning, guided by their skilled student leader. Once the groups had learned their specific skills, they then taught these skills to members of the other groups. This process continued until all groups had learned all five volleyball skills. By the end of this collaborative learning process, all students had acquired and practiced the comprehensive set of

volleyball skills, demonstrating the effectiveness of the Jigsaw method in promoting peer teaching and active learning.

The Jigsaw method was implemented over the 1st and 2nd quarters of the school year, with each quarter consisting of 3 months, totaling 6 months. New materials designed included a researcher-made rubric for volleyball skills assessment and validation form. The materials were validated by different PE teachers who are experts in physical education, coaches who are experts in volleyball, and an English teacher who validated the grammar in the instruments. The teachers during the pre-test were the same teachers who conducted the post-test. The rubric was designed and developed to align with specific objectives using a comprehensive review of other existing and relevant research instruments. The developed rubric was validated and pilot-tested with the assistance of research experts from the university's research and innovation office, ensuring its reliability and validity.

3.7. Data Gathering Procedure

A formal request was made to the dean of the School of Teacher Education to get permission to conduct the study. Using a scoring rubric, the researcher physically carried out a practical assessment to

gauge the respondents' skill profile. A modified questionnaire was used in the study to assess how well jigsaw learning worked when teaching volleyball to 12th Graders. The goal of the Skills Enhancement Program (SEP) is to build skilled volleyball players through strategic planning.

3.8. Statistical treatment of data

The data were retrieved and encoded in MS Excel for statistical analysis. The gathered data would be treated according to the specific sub-problem presented. The researcher utilized the following tools: a) Frequency, Weighted Mean, and Percentage were used to determine the students' skills performance before and after implementing jigsaw learning in volleyball. The Mann Whitney U – Test was employed to determine the significant difference in skills performance before and after using jigsaw learning in teaching volleyball.

3.9. Scoring Schemes

The data were categorized according to the specific sub-problems. The below were adopted. The skills performance of the students before and after using *jigsaw* learning in volleyball along; with serving, passing, setting, spiking/attacking, and blocking was categorized as follows:

**Serving;
Overhand Serve**

Score	Category	Verbal Description
4	Very Good	Respondent sets his/her body in the correct position. Toss the ball in front of his/her hitting arm. Hit the ball with the upper part of his/her palm. Successfully send the ball over the net.
3	Good	Respondent tosses the ball in front of his/her hitting arm. Hit the ball with the upper part of his/her palm but cross beyond the end line.
2	Fair	Respondent hits the ball with the upper part of his/her palm but sends the ball outside the opponent's court.
1	Poor	Respondent is unable to send the ball over the net

Underhand Serve

Score	Category	Verbal Description
4	Very Good	Respondent stands with his feet/staggered. Positioned the ball in front of his/her hitting arm. Make contact with the ball. Successfully send the ball over the net.
3	Good	Respondent positioned the ball in front of his/her hitting arm. Make contact with the ball but cross beyond the end line.
2	Fair	Respondent made contact with the ball but sent the ball outside the opponent's court.
1	Poor	Respondent is unable to send the ball over the net

**Passing;
Forearm Pass**

Score	Category	Verbal Description
4	Very Good	Respondent positioned his/her body for a forearm pass. Hit the ball and follow through with his/her arms in a direction toward the second receiver or setter.
3	Good	Respondent hits the ball and tries to make a follow-through with his/her arms in a direction towards the target but missed to send the ball to his/her target (second receiver/setter)
2	Fair	Respondent missed the target receiver (over-received)
1	Poor	Respondent is unable to make a follow-through with his/her arms.

Overhead Pass

Score	Category	Verbal Description
4	Very Good	Respondent positioned his/her body for an overhead pass with fully extended arms above the forehead. Hit the ball and follow through with his/her arms to the second receiver.
3	Good	Respondent hits the ball and tries to make a follow-through with his/her arms but missed to send the ball to the target (second receiver/setter)
2	Fair	Respondent missed the target receiver (over-received)
1	Poor	Respondent is unable to make a follow-through with his/her arms.

**Setting;
Overhand Set**

Score	Category	Verbal Description
4	Very Good	The respondent stands facing the ball in an overhead position. Contact the ball. Set the ball to a teammate (attacker)
3	Good	The respondent contacts the ball. Set the ball to a teammate (attacker) but hits the antenna.
2	Fair	Respondent sets the ball to his/her teammate (attacker) but the ball goes over the net
1	Poor	The respondent committed a holding violation.

Underhand Set

Score	Category	Verbal Description
4	Very Good	The respondent stands facing the ball in an underhand position. Contact the ball. Set the ball to a teammate (attacker)
3	Good	The respondent contacts the ball. Set the ball to a teammate (attacker) but hits the antenna.
2	Fair	Respondent sets the ball to his/her teammate (attacker) but the ball goes over the net
1	Poor	The respondent committed a holding violation.

Spiking/Attacking

Score	Category	Verbal Description
4	Very Good	Respondent takes steps to set his/her body up for the spike. Jump into the air and successfully spikes the ball over the net.
3	Good	Respondent jumps into the air. Spikes the ball but touches the net.
2	Fair	Respondent spikes the ball over the net but the ball is ruled out.
1	Poor	Respondent jumps into the air but cannot spike the ball over the net.

Blocking

Score	Category	Verbal Description
4	Very Good	Respondent stands with his/her feet shoulder-length apart square to the net. Keep his knees bent. Keep his/her arms high while the palm is facing the net and fingers are spread wide. Jump straight up. Angle his/her hands inwards as if he's grabbing the ball and his/her arms angle over the net.
3	Good	Respondent keeps his/her arms high while the palm is facing the net and fingers are spread wide. Jump straight up. Angle his/her hands inwards as if he's grabbing the ball and his/her arms angle over the net but send the ball outside the court
2	Fair	The respondent jumps straight up. Angle his/her hands inwards as if he's grabbing the ball and his arms angle over the net but committed the touching violation.
1	Poor	Respondent angles his/her hands inwards as if he's grabbing the ball and his arms angle over the net but lands his/her feet crossed to the center line.

4. RESULTS AND DISCUSSION

Performance of the Learners Before Using Jigsaw Learning in Volleyball along; Serving, Passing, Setting, Spiking/Attacking, and Blocking

As shown in Table 2, out of one hundred (100) respondents, in overhand, 5, or 12.5% got very good, 17, or 42.5% obtained good & moderately good, and 1, or 2.5% evaluated poorly. It indicates that the students positioned their bodies correctly, threw the ball in front of their hitting arm, and served it overhand with the upper portion of their palm, sending it outside the opponent's court. When

servicing the ball underhand, 7, or 11.66% scored extremely well, 25, or 41.70% scored good and moderately well, and 3, or 5% scored poorly. It indicates that the pupils should place the ball in front of their hitting arm, stand with their feet spaced apart, and serve underhand but over the line. This result suggests that, with a Mean of 2.62, the students' serving skills performance was good before adopting jigsaw learning in volleyball. Weldon et al. (2021) indicated that players had to practice addressing a gap caused by a lack of skills.

Table 2. Volleyball serving performance of the students before using Jigsaw learning

Serving Score	Overhand		Underhand		Description
	Frequency	%	Frequency	%	
4	5	12.5	7	11.66	Very Good
3	17	42.5	25	41.70	Good
2	17	42.5	25	41.70	Fair
1	1	2.5	3	5.00	Poor
Total	40	100	60	100	
Mean	2.62				Good

Table 3 presents the skills performance of the students before using Jigsaw learning in volleyball along with passing.

As reflected in Table 3, out of one hundred (100) respondents, 1 or 3% got very good in the overhead pass, 11 or 37% earned good, 12 or 40% obtained moderately good, and 6 or 20% evaluated poorly. It means that the students positioned their body for an overhead pass with a fully extended arm, above the forehead, while forearm pass, 2 or 2.9% got very good, 27 or 38.5% earned good, 38 or 40% obtained moderately good, and 13 or 18.6% evaluated poorly.

It means that the student positioned their body for a forearm pass, hit the ball and follow through with its arms towards the target but missed the target receiver (over-received). This result implies that the skills performance of the students on passing before using jigsaw learning in volleyball was good with a Mean of 2.59. This claim is supported by the study of Saleem (2006) which recommended the use of gaining classification strategy in learning volleyball basic skills (setting-receiving-passing). For Ajayati (2017), forearm passing should be practiced especially for players who are still learning the skill.

Table 3. Volleyball passing performance of the students before using Jigsaw learning

Passing Score	Overhead Pass		Forearm Pass		Description
	Frequency	%	Frequency	%	
4	1	3	2	2.9	Very Good
3	11	37	27	38.5	Good
2	12	40	28	40.0	Fair
1	6	20	13	18.6	Poor
Total	30	100	70	100	
Mean	2.59			Good	

Table 4 presents the skills performance of the students before using Jigsaw learning in a volleyball-along set.

As stated in Table 4, out of one hundred (100) respondents, in the overhead Set, 6 or 9% got very good, 31 or 48% earned good, 23 or 35% obtained moderately good, and 5 or 8% evaluated poorly. It means that the students were standing facing the ball with an overhead position, contacted the ball, and tried to set the ball to its teammate (attacker), but the ball went over the net, while underhand set, 3 or 8.5% got very good, 17 or 48.5% earned good, 13 or

37% obtained moderately good, and 2 or 6% evaluated poorly. It means that students stood facing the ball with an underhand position, contacting the ball, and trying to set the ball to its teammate (attacker), but the ball went over the net. This result shows that the skills performance of the students on setting before using jigsaw learning in volleyball was moderately good with a Mean of 2.25. The jigsaw method's application enhanced learning activities and enhanced players' setting abilities (Dewi, 2016). In setting, the location should be the main priority (Rocha et al., 2020).

Table 4. Volleyball setting performance of the students before using Jigsaw learning

Setting Score	Overhead Set		Underhand Set		Description
	Frequency	%	Frequency	%	
4	6	9	3	8.5	Very Good
3	31	48	17	48.5	Good
2	23	35	13	37.0	Fair
1	5	8	2	6.0	Poor
Total	65	100	35	100	
Mean	2.25			Moderately Good	

Table 5 presents the skills performance of the students before using Jigsaw learning in volleyball along with spiking/attacking.

As mentioned in Table 5, out of one hundred (100) respondents, 1 or 1% got very good, 21 or 21% earned good, 44 or 44% obtained moderately good, and 34 or 34% evaluated poorly. It indicates that even when the student jumps into the air and moves

to position their body for the spike, they are unable to spike the ball over the net. This result poses that the student's skills in spiking before using jigsaw learning in volleyball were moderately good with a Mean of 1.89. Shekarriz et al. (2013) emphasized that the agility of the players is required to become successful in spiking. The speed of the spiking depends on the readiness of the player (Oliveira et al., 2020).

Table 5. Spiking and attacking performance of the students before using Jigsaw learning

Spiking/Attacking (Score)	Frequency	Percentage	Description
4	1	1	Very Good
3	21	21	Good
2	44	44	Fair
1	34	34	Poor
Total	100	100	
Mean	1.89		Fair

Table 6 presents the skills performance of the students before using Jigsaw learning in volleyball along with blocking.

Table 6. Volleyball blocking performance of the students before using Jigsaw learning

Blocking (Score)	Frequency	Percentage (%)	Description
4	1	1	Very Good
3	18	18	Good
2	54	54	Fair
1	27	27	Poor
Total	100	100	
Mean	1.93		Fair

As indicated in Table 6, out of one hundred (100) respondents, 1 or 1% got very good, 18 or 18% earned good, 54 or 54% obtained moderately good, and 27 or 27% evaluated poorly. It means that the students kept their arms high while their palm were facing the net, their fingers spread wide, jumped straight up, angled their hands inwards as if they grabbed the ball, and their arms angle over the net but landed their feet crossed to the centerline. This result implies that the overall skills performance of

the students on blocking before using jigsaw learning in volleyball was moderately good with a Mean of 1.93. According to Stafford (2021), choosing and managing the right line of action is essential for effective navigation (blocking) through our surroundings. According to ecological psychology, information defining affordances—the fit between an actor's action possibilities and their environment—is detected and used to influence judgments about when and how to act. Lobiatti (2009) expressed that the blocking footwork technique should be observed for optimum results.

Performance of the Learners After Using Jigsaw Learning in Volleyball along; Serving, Passing, Setting, Spiking/Attacking, and Blocking

This section presented the skills performance of the students after using jigsaw learning in volleyball along with serving, Passing, Setting, Spiking/Attacking, and Blocking.

Table 7 presents the learners' performance after using Jigsaw learning in volleyball along with serving.

Table 7. Volleyball serving performance of the learners after using Jigsaw learning in volleyball

Serving Score	Overhand		Underhand		Description
	Frequency	%	Frequency	%	
4	24	60.0	37	62.0	Very Good
3	15	37.5	23	38.0	Good
2	1	2.5	0	0.0	Fair
1	0	0	0	0.0	Poor
Total	40	100	60	100	
Mean		3.60			Very Good

As shown in Table 7, out of one hundred (100) respondents, in overhand, 24, or 60% got very good, 15, or 37.5% earned good, 1, or 2.5% obtained moderately good, and nobody evaluated poorly. It shows that the students tossed the ball in front of their striking arms, positioned their bodies correctly, and smacked the ball underhand, crossing the finish line, and overhand with their upper palms. Of those who hit the ball underhand, 37, or 62%, received very good, 23, or 38% received good, and no one received moderately good or poor. It means that the students were standing with their feet staggered, positioned the ball in front of their hitting arm, and

served the ball underhand but crossed beyond the end line.

This result implies that the students' display of skills in serving after using jigsaw learning in volleyball was very good with a Mean of 3.60. The research conducted by Bruton & Wright (2021) shows that giving attention to movements enhances the brain in tasks such as serving, passing, setting, spiking/attacking, and blocking. Athletes benefit from it by honing their skills, gaining confidence, and becoming better players.

Table 8 presents learners' performance after using Jigsaw learning in volleyball along with passing.

Table 8. Volleyball passing performance of the learners after using Jigsaw learning

Passing Score	Overhead Pass		Forearm Pass		Description
	Frequency	%	Frequency	%	
4	17	57	40	57.14	Very Good
3	13	43	29	41.43	Good
2	0	0	1	1.43	Fair
1	0	0	0	0	Poor
Total	30	100	70	100	
Mean	3.56			Very Good	

As reflected in Table 8, out of one hundred (100) respondents, in the overhead pass, 17, or 57% got very good, 13, or 43% earned good, and nobody obtained moderately good & poor. It means that the student positioned their body for an overhead pass with fully extended arms, above the forehead, hit the ball, and followed through with their arms to the second receiver (setter), while forearm pass, 40 or 57.14% got very good, 29 or 41.43% earned good, 1 or 1.43% obtained moderately good, and nobody evaluated poorly. It means that the student positioned their body for a forearm pass, hit the ball, and followed through with their arms in a direction toward the second receiver (setter).

This result expresses that the student’s skill performance in passing after utilizing jigsaw learning in volleyball was very good with a Mean of 3.56. Syaparuddin (2016) suggested that integrations of direct instructional methods and cooperative learning should have a significant impact on the skills of passing the ball. To achieve these things, (Reyes, 2013), students who have favorable attitudes regarding the subject are more likely to become engrossed in skills training that are appropriate for their skills and competence levels.

Table 9 presents the learners' performance after using Jigsaw learning in volleyball along with the set.

Table 9. Volleyball setting performance of the learners after using Jigsaw learning

Setting Score	Overhead Set		Underhand Set		Description
	Frequency	%	Frequency	%	
4	17	57	40	57.14	Very Good
3	13	43	29	41.43	Good
2	0	0	1	1.43	Fair
1	0	0	0	0	Poor
Total	30	100	70	100	
Mean	3.30			Good	

As stated in Table 9, out of one hundred (100) respondents, in the overhead set, 17, or 57% got very good, 13, or 43% earned good, and nobody obtained moderately good & poor. The students were standing facing the ball with an overhead position, contacted the ball, and tried to set the ball to its teammate (attacker), but the ball went over the net, while underhand set, 40 or 57.14% got very good, 29 or 41.43% earned good, 1 or 1.43% obtained moderately good, and nobody evaluated poorly. It means that the students stand facing the ball with an underhand position, contact the ball, and try to set the ball to its teammate (attacker), but the ball goes over the net.

jigsaw learning in volleyball was good with a Mean of 3.30. Bruton & Wright (2021) emphasized that athletes improve their techniques on setting the ball and develop their confidence to become better athletes when watching the movements on the setting, which activates parts of the brain.

Table 10 presents the learners’ performance after using Jigsaw learning in volleyball along with spiking/attacking.

As mentioned in Table 10, out of one hundred (100) respondents, 19 or 19% got very good, 60 or 60% earned good, 20 or 20% obtained moderately good, and 1 or 1% evaluated poorly. This indicates that the kids jump into the air, set themselves up for the spike, and then spike the ball without touching the net.

This result reveals that the student’s skill performance in the volleyball setting after utilizing

Table 10. Performance of the learners after using Jigsaw learning in volleyball: spiking/attacking

Spiking/Attacking (Score)	Frequency	Percentage (%)	Description
4	19	19	Very Good
3	60	60	Good
2	20	20	Fair
1	1	1	Poor
Total	100	100	
Mean	2.97		Good

This result addresses that the student’s skills performance in spiking after utilizing jigsaw learning in volleyball was good with a Mean of 2.97. According to Yaayin et al. (2021), the model was successful in producing noticeably better spiking and attacking performance, which provided a solid basis for the students to hone their volleyball skills and expand their creativity, both of which improved performance in a functional group like volleyball.

Table 11 presents the learners’ performance after using Jigsaw learning in volleyball along with blocking.

Table 11. Performance of the Learners After Using Jigsaw Learning in Volleyball: Blocking

Blocking (Score)	Frequency	Percentage (%)	Description
4	15	15	Very Good
3	61	61	Good
2	21	21	Fair
1	3	3	Poor
Total	100	100	
Mean	2.88		Good

As indicated in Table 11, out of one hundred (100) respondents, 15 or 15% got very good, 61 or 61%

earned good, 21 or 21% obtained moderately good, and 3 or 3% evaluated poorly. It means that the student was ready at all times, stood with their feet shoulder-length apart square to the net, kept their knees bent, kept their arms high while palm was facing the net and fingers were spread wide, jumped straight up, angled its hands inwards as if it is grabbing the ball and its arms angle over the net but sent the ball outside the court.

This result displays that the skills performance of the students on blocking after using jigsaw learning in volleyball was good with a mean of 2.88. Stafford (2021) stated that successful navigation in blocking the ball depends on selecting the appropriate course of action and environment. Ecological psychology states that information defining affordances is detected to choose when and how to block the ball.

Significant Difference Between the Skills Performance Before and After Using Jigsaw Learning in Teaching Volleyball in Grade 12

Table 12 summarizes the test results significant difference between the skills performance before and after using Jigsaw learning in teaching volleyball in Grade 12.

Table 12. Significant difference between the skills performance before and after using Jigsaw learning in teaching volleyball in grade 12

Variables (Pre and Post Test)	$\rho = Value$	Decision Ho ($\alpha = 0.05$)	Interpretation	w-computed Strength
Significant Difference between the skills (Serving, passing, setting, attacking, and blocking) performance before and after using Jigsaw learning in teaching Volleyball in Grade 12	0.0000	Reject Ho	Significantly difference	6163.0 Higher positive relationship

The computed z-value (-9.532), and the $\rho = value$ 0.001 was lesser at 0.5 level of significance. This led to the rejection of the null hypothesis; hence there is a significant difference between the skills performance before and after using jigsaw learning in teaching volleyball. Meaning there was a higher

positive difference between paired values. Therefore, it implies that using Jigsaw learning has a higher positive impact on the skill performance of the students. According to Reyes (2013), students who have favorable attitudes toward the subject are more likely to become engrossed in skill-building

activities that correspond to their level of knowledge, competence, and proficiency. From Abuhamda et al. (2020) and Samangun et al. (2024), the jigsaw technique can aid students in comprehending key ideas.

5. CONCLUSION

The performance of learners in volleyball significantly improved after the implementation of Jigsaw learning across various skills: serving, passing, setting, spiking/attacking, and blocking. Before using Jigsaw learning, students exhibited moderate proficiency, with most skills rated as fair to good. However, after employing this cooperative

learning strategy, students' skill levels notably increased, with the majority of scores falling into the good to very good range. This indicates a higher positive relationship and suggests that Jigsaw learning effectively enhances students' volleyball skills, supporting the assertion that such instructional methods foster better skill acquisition and performance.

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