Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

THE IMPACT OF A STRATEGY BASED ON TRI-INTELLIGENCE ON GENERATIVE THINKING AND THE ACQUISITION OF VOLLEYBALL SETTING AND SPIKING SKILLS AMONG STUDENTS

Nour ayad Abbas
noor.a.abbas@uotechnology.edu.iq
Technological University – Student Activities Department

Research Summary
The study aimed to identify the level of (creative thinking—preparation—presentation) among the research sample. It also aimed to develop instructional units based on a strategy grounded in tri-intelligent thinking for creative thinking and the learning of setting and serving skills among the research sample, and to identify the impact of a strategy grounded in tri-intelligent thinking on creative thinking and the learning of setting and serving skills in volleyball among the research sample. The researcher hypothesized that there would be statistically significant differences between the pre- and post-tests in creative thinking and the learning of setting and spiking skills in volleyball for university students, The researcher also hypothesized that there would be statistically significant differences between the post-test results in creative thinking and the learning of setting and serving skills in volleyball among university students. The researcher employed an experimental approach using a design with experimental and control groups of equal size, each undergoing pre- and post-tests. The research sample was selected using a purposive sampling method, consisting of second-year students in the College of Physical Education and Sports Sciences at Al-Farahidi University for the academic year (2026), totaling 120 students distributed across seven sections, with 20 students in each section. Students were selected from Sections B and E at random via a lottery, The creative thinking test was administered to the research sample in the classroom, in addition to the skill tests consisting of volleyball serving and setting tests in the college's indoor court. The results were compiled and statistically analyzed, and the researcher reached a set of conclusions, the most notable of which was the clear superiority of the strategy based on the clearly outperformed the method used to develop cognitive abilities specifically creative thinking and the skills of setting and serving among the research sample. In light of these findings, the researcher recommends adopting the tri-intelligence strategy as a core curriculum for teaching volleyball skills to students in physical education and sports science colleges.

Keywords:
Keywords: Strategy based on triple intelligence, generative thinking,Setting, and serving in volleyball.

1. Introduction to the Study

1.1 Introduction

College sports are considered a comprehensive learning environment, serving as a fertile ground for developing students' skills and refining their physical and mental abilities. Among these team sports is volleyball, a highly popular game that helps improve students' mental and social skills due to the precision in performance and speed of decision-making it requires, in addition to coordinated teamwork in the skills of serving and setting the ball The serve and set are considered among the most essential skills, requiring high precision and neuromuscular coordination that defines a player's level, as the serve is the primary means of starting the match and the set is the starting point for building an attack and controlling the flow of play. These

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

two skills require modern, innovative teaching strategies that go beyond traditional methods, which shifted the learner's role from a rote-learning approach to activating their role and mental abilities in a way that keeps pace with cognitive developments and thinking styles, and integrates the investment of students' mental and physical abilities. From this emerged the theory of multiple intelligences, which revolutionized the concept of intelligence by dividing it into three main dimensions (analytical intelligence, creative intelligence, and practical intelligence). Since integrating these dimensions enables learners to process information in a holistic manner, this may help transform the learning process from mere skill execution to innovative performance and quick responses to changing situations on the field, thereby enhancing their capacity for generative thinking, which is based on producing new, innovative motor ideas and solutions grounded in their analytical and practical understanding of the skill—transcending the boundaries of traditional skills among students. This contributes to the ability to be creative in the performance of volleyball skills, particularly serving and setting, and to translate theory into effective practical application on the court (Mansour et al., 2012, p. 77), as this strategy is not limited to improving technical skills alone but also contributes to enhancing critical and creative thinking, which enables students to generate new solutions and devise diverse approaches to skill performance. This positively impacts the university student's personality and their ability to face athletic and academic challenges and find solutions for them. Hence, the importance of this research is highlighted, as it is not limited to developing specific athletic skills but seeks to build an integrated educational model that links mental abilities with physical skills and makes athletic skills a platform for generating ideas and creativity.

1-2 Research Problem

The research problem is evident through the researcher's observations, field experience, and academic follow-up, which reveal a clear weakness and slowness in the process of learning basic volleyball skills among students, specifically the skills of setting and serving, which form the cornerstone of building offensive and defensive strategies on the court and upon which individual and team performance in this sport. and despite the efforts made, the educational reality points to traditional teaching methods that focus on the motor aspect based on the American style. This shortcoming leads to a weakness in students' ability to cope with changing situations during play and limits their potential to develop new solutions and innovate diverse performance styles, as well as a lack of sufficient attention to the through which we can gain a deep understanding of their analytical components. This aligns with the philosophy of triple intelligence, which integrates analysis, creativity, and practical application. Among these mental abilities is generative thinking, considered one of the most important forms of creative and innovative thinking. This, in turn, stimulates them to be creative in athletic performance and to develop generative thinking among students, while simultaneously measuring its effectiveness in improving the learning of setting and serving skills in volleyball, as these are among the most important fundamental skills that directly influence students' overall performance on the court. Hence, the need arose to employ modern instructional strategies such as the strategy based on triple intelligence, with the aim of improving creative thinking and developing setting and serving skills in volleyball.

1-3 Research Objectives

1. To identify the level of (generative thinking—preparation—execution) among second-year students at Al-Farahidi University, College of Physical Education and Sports Sciences.
2- To develop instructional units based on a strategy grounded in tri-intelligent thinking to teach the skills of setting and spiking to the research sample.
3- To determine the impact of a strategy grounded in tri-intelligent thinking on the development of setting and spiking skills in volleyball among the research sample.

1-4 Research Hypotheses

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

1. There are statistically significant differences between the pre-test and post-test scores in generative thinking and the learning of setting and serving skills in volleyball among university students.
2- There are statistically significant differences between the post-test results in generative thinking and the learning of setting and serving skills in volleyball among university students.

1-5 Research Scope

1-5-1 Human Scope: A sample of second-year students at Al-Farahidi University, College of Physical Education and Sports Sciences.
1-5-2 Temporal Scope: From February 10, 2026, to March 25, 2026
1-5-3 Spatial Scope: The lecture hall and indoor gym at the College of Physical Education and Sports Sciences / Al-Farahidi University.

1-6 Definition of Terms

Triarchic Intelligence: It is an integrated system of cognitive abilities that enables individuals to succeed within their social and cultural contexts by optimally leveraging their personal strengths and addressing or compensating for their weaknesses, thereby achieving a delicate balance between analytical, creative, and practical skills to ensure effective adaptation to and shaping of the surrounding environment. (Sternberg & Grigorenko, 2002, p. 32)
Generative thinking: An individual's possession of the mental capacity that enables them to confront various dilemmas by building cognitive bridges that connect their past experiences with newly acquired knowledge, thereby ensuring the construction of new and innovative ideas and concepts. (Abu Sharkh, 2017, p. 26)

2. Research Methodology and Field Procedures

2.1 Research Methodology

The researcher employed an experimental methodology using a design with experimental and control groups of equal size, incorporating pre- and post-tests

2-2 Research Population and Sample

The research population was selected using a purposive sampling method, consisting of second-year students in the College of Physical Education and Sports Sciences at Al-Farahidi University for the academic year (2026), totaling 120 students distributed across seven sections, with 20 students in each section. Sections (B) and (E) were selected randomly by drawing lots. Since they belong to the same age group, the sample is homogeneous, and their heights range between 170 and 180 cm, In addition to the exploratory sample of 12 students, which was drawn from the original population outside the experimental and control groups, the educational program was implemented using the tri-intelligence strategy on the experimental group to determine the strategy's impact on skill learning, while the college curriculum was used for the control group.

2-3 Tools and Equipment Used in the Study

- Laptop
- Camera
- Data collection forms for skills and scales
- Swedish chair
- Basketball hoop
- 20 volleyballs
- Internet access
- Standard volleyball court
- Colored tape with a measuring tape
- Flash drive with a disk (c-d)

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

2-4 Tests and Measures Used in the Study

2-4-1 Volleyball Accuracy Test (Ali Salman, 2014, p. 12)

Purpose of the test: To measure the accuracy of overhead serves

Equipment: Basketball hoop, a Swedish bench placed in front of the hoop at a distance of 4 meters, a volleyball.

Performance specifications: The subject stands in front of the Swedish bench and performs 30 passes over the basketball hoop, ensuring the ball passes through the hoop without touching it.

Scoring: 4 points for each successful pass in which the ball enters the hoop without touching it.

3 points for each successful pass in which the ball touches the backboard and enters the hoop.

1 point for each successful pass in which the ball touches the backboard and enters the hoop.

2-4-2 Volleyball Serve Accuracy Test (Mohamed Sobhi Hassanein, 2003, p. 39)

Serve Accuracy Test for Specific Targets

Purpose of the Test: To measure serve accuracy at specific targets

Equipment: A regulation volleyball court, 6 balls; the court is divided into three zones.

Performance specifications: The test subject performs 10 serves to each of the three designated zones, i.e., 10 serves to Zone A, 10 serves to Zone B, and 10 serves to Zone C. Only attempts in which the ball lands in the designated zones are counted

Scoring: 4 points are awarded for each successful serve that lands in the designated zone.

2-4-3 Generative Thinking Test

The scale developed by (Abdullah Hazza's team, 2022, p. 66) consists of 38 items distributed across four scales: (Strongly Agree, Agree, Sometimes Agree, Disagree, Strongly Disagree), with scores assigned as follows: if positive (5-4-3-2-1) respectively, and if negative, (1-2-3-4-5) respectively. Thus, the highest possible score on the scale is (190), the lowest is (38), and the midpoint is (114). Appendix 1 presents the generative thinking scale.

2-5 Pilot Studies

2-5-1 Pilot Study on the Generative Thinking Test and the Volleyball Setting and Spiking Test in volleyball

The researcher conducted a pilot study on Sunday, February 8, 2026, with a sample of 12 male students from the morning session. They were given the Generative Thinking Scale questionnaires to ensure they answered according to the scale's instructions; completing the scale took 10–15 minutes. Following this, skill tests were administered, consisting of a set accuracy test using the basket hoop and a serve accuracy test to specific areas of the court, on Monday, February 9, 2026, at the college's indoor court to verify the accuracy of the designated zones (A, B, C) on the court and to confirm the number of passing attempts (30). The researcher found that the skill tests took approximately (25) minutes, including the warm-up period. The results indicated that all items of the scale were valid for the sample, that the skill tests were appropriate for the participants' level, and identified obstacles to be avoided during the main experiment.

2-5-2 Pilot Study of the Tri-Intelligence-Based Strategy

The researcher conducted the pilot study of the strategy based on the tri-intelligence theory on Tuesday, February 10, 2026, with a pilot sample consisting of (6) students. It lasted for one week, comprising two instructional units, to ensure the strategy's suitability for the sample's level and their ability to grasp the theoretical explanation of the skills of setting up and passing by verifying the appropriateness of the analytical component and ensuring that the analytical questions posed by the researcher stimulate students' thinking

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

without causing distraction, in addition to examining innovative situations related to the creative aspect, which require the student to generate alternative motor solutions when facing difficulties in directing the ball during preparation or serving, In addition to measuring the effectiveness of the practical aspect by ensuring that sufficient time is allocated for practical application within the lesson, observing the transfer of mental thinking to motor performance on the field, and ensuring the effectiveness of the teaching aids used, The results of the pilot experiment identified the obstacles encountered, and the students showed great enthusiasm for applying the triple intelligence strategy, which provided a positive indication of the success of the main experiment.

2.6 Pre-test

To start from a single point of departure, the researcher conducted the pre-tests for the creative thinking scale and the skill tests for the experimental and control groups in the classroom on Wednesday, February 11, 2026. After completing the scale items, which took 15 minutes, the participants went out to the volleyball court to conduct the skill tests, which consisted of the set accuracy and serve accuracy tests. This was done after providing two introductory sessions on the skills of setting and serving in volleyball, explaining and clarifying them thoroughly. The researcher also ensured that conditions were standardized for both the experimental and control groups in terms of time, tools and equipment used, and weather conditions, in addition to excluding the pilot study sample.

After the researcher conducted the pre-tests for the control and experimental groups, she performed an equivalence analysis between the two groups, which included the creative thinking scale and skill tests for the students' volleyball serving and setting skills. Table 1 illustrates the equivalence of the sample in the aforementioned research variables.

Table (1)

shows the equivalence of the experimental and control groups in terms of the research variables

Significance	Error Level	Calculated t	Control Group		Experimental Group		Research Variables
			SD	Mean	SD	Mean	
Not Significant	0.98	0.26	5.80	114.90	6.20	115.40	Generative Thinking -1
Not Significant	1.15	0.22	7.20	36.10	7.40	35.60	Setting (Volleyball) -2
Not Significant	1.36	0.15	8.70	41.60	8.50	42.0	Serving (Volleyball) -3

Moral below the significance level (0.05) and degrees of freedom (38)

2-7 Implementation of the Educational Program Based on the Tri-Intelligence Strategy

The educational program was implemented on [date] using the tri-intelligence-based strategy to develop creative thinking and the students' ball-passing and ball-shooting skills, as tri-intelligence includes one of the three types of intelligence, namely creative (generative) intelligence. The researcher conducted 12 instructional units using this strategy with the experimental sample, at a rate of two instructional units per week one for the passing skill and the other for the serving skill spread over six weeks. Thus, each skill received 6 instructional units. Each unit lasted 90 minutes, and the instructional units were presented to a group of experts in the field to ensure their validity and the appropriateness of the sample. The instructional program was implemented from Sunday, February 15, 2026, through Monday, March 23, 2026.

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

The steps of the strategy based on triple intelligence consist of:
1. Introduction: Reviewing prior knowledge about volleyball and increasing students' motivation to learn
2- Organization: Dividing students into groups to teach them how to organize their ideas and the information they possess, thereby enhancing their ability to grasp the required skills
3- Activation: Utilizing the specific type of intelligence to be activated; the activation process varies depending on the type of intelligence—whether creative, analytical, or practical
The researcher utilized the three types of intelligence within a single instructional unit as follows:
A. (Analytical Intelligence): Mentally breaking down the skill
Application: The teacher demonstrates the skill and then asks analytical questions, such as, "Why must the ball be touched with the fingers rather than the palm during the preparatory phase?"
Student's role: The student compares, critiques, and independently identifies the causes of motor errors.
B. (Creative/Generative Intelligence): Generating non-standard motor solutions
Application: The teacher presents the student with a problem, for example, asking, "Imagine the ball has reached you and is behind your head: come up with a movement solution to set it up for your teammate."
Student's role: Generating new movement ideas and testing them in practice without fear of making mistakes
C. (Practical Intelligence): Applying knowledge and innovation in a practical performance context
Application: Performing the skill exercises prepared by the researcher; here, ideas are transformed into precise motor actions.
Student's Role: Using their practical intelligence to adapt to the conditions of the exercise and achieve the best result.
4- Coding Information: This involves placing ideas in an educational context appropriate for the student.
5- Assessment: We identify students' strengths and weaknesses, strengthen and address their weaknesses, provide guidance, and reinforce positive aspects across all lesson components to achieve the desired learning objectives.
6- Reinforcement and follow-up: Praising and encouraging correct performance to reinforce the acquired skill
- The researcher reviewed a selected instructional unit for the serving skill, as shown in Appendix No. (2)
2.8 Post-tests
The researcher administered the post-tests to the experimental and control groups on Tuesday and Wednesday, March 24–25, 2026. On Tuesday, the post-test for the Generative Thinking Scale was administered to the experimental and control groups. After the responses were completed, the data were collected for statistical analysis. On Wednesday, March 25, 2026, skill tests were conducted, including setting and serving skills, for both the control and experimental groups on the college's volleyball court. The researcher ensured that the same conditions—including equipment, tools, and weather conditions—were maintained as in the pre-test to ensure objectivity in the interpretation of results.
2-9 Statistical Methods
1- Arithmetic Mean
2- Standard Deviation
3- Simple Correlation Coefficient
4- SPSS Statistical Package by Al-Fartousi Ali Samoum and Al-Husseini Sadiq (2020)
3 - Presentation, Analysis, and Discussion of Results
3-1 Presentation of the results of the pre- and post-tests for the control group on generative thinking and the skill tests under study
Table (2)

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

shows the significance of the differences in the pre- and post-tests for the control group sample in the variables under study

Significance	Error Level	Calculated t	SD (.diff)	Mean (.diff)	Post-test		Pre-test		Variables
					SD	Mean	SD	Mean	
Significant	0.000	12.30	1.20	3.30	5.40	118.20	5.80	114.90	GenerativeThinking
Significant	0.000	10.13	1.50	3.40	6.80	39.50	7.20	36.10	Setting (Volleyball)
Significant	0.000	9.18	1.80	3.70	8.20	45.30	8.70	41.60	Serving (Volleyball)

Below the significance level (0.05) and below a score of (19)

3-2 Presentation of the results of the pre- and post-tests for the control group on generative thinking and the skill tests under study

Table(3)

shows the results of the significance of differences in the pre- and post-tests for the experimental group sample on the variables under study

Significance	Error Level	Calculated t	SD (.diff)	Mean (.diff)	Post-test		Pre-test		Variables
					SD	Mean	SD	Mean	
Significant	0.000	82.12	1.80	33.10	4.80	148.50	6.20	115.40	Generative Thinking
Significant	0.000	79.24	2.10	37.20	5.20	72.80	7.40	35.60	Setting (Volleyball)
Significant	0.000	80.65	2.40	43.30	6.10	85.30	8.50	42.00	Serving (Volleyball)

Significant at the 0.05 level and with a score of (19)

3.3- Presentation of the results of the pre- and post-tests for the control and experimental groups in generative thinking and the skill tests under study

Table (4)

Table 4 presents the results of the significance of differences in the post-tests for the control and experimental groups in the variables under study

Significance	Error Level	Calculated t	Control Group		Experimental Group		Variables
			SD	Mean	SD	Mean	
Significant	0.000	18.72	5.40	118.20	4.80	148.50	Generative Thinking
Significant	0.000	17.45	6.80	39.50	5.20	72.80	Setting (Volleyball)
Significant	0.000	17.58	8.20	45.30	6.10	85.30	Serving (Volleyball)

Below the significance level (0.05) and below a score of (38)

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

3-4 Discussion of Results

A review of the above results shows that the control group outperformed the experimental group in the variables (generative thinking – preparation – transmission). The researcher attributes this improvement to the school's use of the scientific method and the impact of the instructional units in the curriculum followed by Al-Malda School, which includes repetition of skill performance and continuity of motor performance, necessarily leading to improved skill performance.

The results also show a marked superiority of the experimental group that was taught using the tri-intellect strategy. The researcher attributes this to the organization of motor information and the sequence of performance, as the strategy helped the students organize information related to the skills of preparation and passing in their minds before beginning the execution process. This organization served to reduce distractions and, consequently, the construction of a clear motor plan, which led to increased accuracy in directing the ball toward specific areas of the field. (Hadeel Alaa. 2024. p. 86)

This development also served to stimulate the students' motivation and break their inertia, as the use of the principles of triple intelligence (creative, analytical, and practical) added a sense of excitement and suspense to the instructional unit, which increased the students' motivation to learn and made them more attentive and focused while performing skill exercises related to setting and serving. This had a positive impact on the consistency of their performance and led to a noticeable improvement.

The researcher also attributes this development to the fact that the strategy stimulates critical thinking among the students, as its steps are designed to place the student in situations (problems) that require a solution. In learning the skills of setting and serving in volleyball, the student did not hit the ball randomly; but rather learned how to generate a movement trajectory that aligns with the desired target. This type of learning contributed to the development of skill performance to the extent that the student became aware of the power of the hit and the angle of flight to land the ball in a specific area of the court. (Al-Atoum et al. 2009, p. 22)

Furthermore, the development in this research contributed to transforming the students from consumers to producers of movement, placing the student at the center of the educational process. She does not merely imitate the teacher's movements but participates in analyzing the strengths and weaknesses of her own performance. This mental dialogue, scrutiny, and discussion regarding how to execute the skills of setting and serving allowed the technical rules for skill acquisition to become deeply ingrained in long-term memory, making it easier to recall and apply them with high precision in the movement situations that require them.

In addition to fostering team spirit and collaborative learning—as it provided an opportunity for positive communication among the students and the exchange of experiences in choosing the best angle for setting or the strongest point for serving—this positive interaction on the court boosted their self-confidence and eliminated the fear of failure, thereby enhancing their achievement and skill proficiency. (Al-Samara'i, Nabiha Saleh. 2013. p. 84)

The clear improvement in creative thinking skills also gave the students the freedom to generate unconventional ideas and practical solutions to tackle challenging situations in learning the targeted skills. Instead of adhering to a single approach, students became capable of generating multiple alternatives, which contributed to increasing the flexibility of their thinking and the speed at which they produced new and productive ideas and their interaction with their peers, which led to a shift in the students' responses from stereotypical to innovative. Through questions that stimulate scientific and motor imagination, the students' minds were trained to seek alternative movements, keeping them alert and able to anticipate events during skill performance and generate the most appropriate solution at the right time. (Sarour, Nadia Hayel. 2005. p. 42).

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

It also enabled the learning environment to foster the students' creative abilities, as the learning environment based on triple intelligence provided a safe haven for students to experiment with their generative ideas without fear of making mistakes. This psychological and cognitive support made the student feel like a thinker rather than merely a performer, which led to an increase in the flow of her creative ideas. Teaching with this strategy fosters confidence, as the development in creative thinking was not merely mental but translated into precision in the students' performance of the skills of preparation and delivery; the more the students' ability to generate ideas and mental solutions, the more efficient they became in practically applying these skills, which enabled them to clearly master the technical performance.

4 – Conclusions and Recommendations

4-1 Conclusions

1. The strategy based on tri-intellect clearly outperformed the approach used to develop cognitive abilities specifically generative thinking and the skills of setting and serving in the study sample.
2- There is a direct relationship between the development and enhancement of the dimensions of triple intelligence (analytical, generative, and practical) and the accuracy of serving and setting skills in volleyball.
3- The generative aspect of the instructional units helped students become producers of motor solutions rather than passive recipients of the information provided.
4- The tri-intellect strategy succeeded in breaking the monotony of traditional lessons, thereby increasing students' motivation toward innovation in serving and setting skills.
5- Linking the mental analysis of the skill with practical application reduced learning time and increased the accuracy of skill performance.
6- The results confirmed that generative thinking is not merely an innate trait but a mental skill that can be developed and nurtured in specific, well-designed educational settings.

4.2 Recommendations

1. The need to adopt the tri-intelligence strategy as the primary approach to teaching volleyball skills to students in physical education and sports science programs.
2- The need to move away from rote learning when teaching volleyball skills and to focus on involving students in analyzing their mistakes and generating alternatives to correct them on their own.
3- Conduct similar research using the tri-intelligence strategy on other defensive and offensive skills, such as the spike and the block.
4- Encourage curricula to integrate psychological and cognitive aspects with motor aspects in order to develop intelligent students capable of making quick decisions in changing game situations.
5- Conduct similar research on a sample of female students.
6- Focus on measures of thinking, such as generative thinking, as a fundamental assessment tool alongside physical and skill-based tests.

References

1. Abu Sharkh, Asma Youssef (2017). Educational Psychology. 7th ed. Dar Al-Maysara. Amman, Jordan.
2. Al-Samarai, Nabiha Saleh (2013). Modern Strategies in Science Teaching Methods. Dar Al-Manaahij for Publishing and Distribution. Amman, Jordan.
3. Al-Atoum, Adnan Youssef; Al-Jarrah, Bashara Muwaffaq; Abd al-Nasser, Thiab (2009). Developing Thinking Skills: Theoretical Models and Practical Applications. 2nd ed. Dar al-Maysara for Publishing and Distribution.
4. Al-Fartousi, Ali Samoum; Al-Husayni, Sadiq (2020). Measurement and Evaluation in Mathematics. Dar Al-Fikr Al-Arabi. Baghdad.

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

5. Sarour, Nadia Hayel (2005). Teaching Thinking in the School Curriculum. 1st ed. Dar Wael for Publishing and Distribution.
6. Ali Salman Abdul-Tarfi (2014). Skill Tests in Volleyball. 2nd ed. Dar Al-Fikr Publishing and Distribution.
7. Fariq Abdullah Hazza (2022). The Effect of John Zahorik's Constructivist Model on Generative Thinking and the Learning of Some Basic Skills in Futsal for Female Students. Doctoral dissertation. University of Karbala.
8. Mohammed Subhi Hassanein. Measurement and Evaluation in Physical Education. 2nd ed. Dar Al-Fikr Al-Arabi. Cairo.
10. Mansour Hama Abdulrahman, Muhammad, Mona Abdelsabour, Hussein, and Mona Abdulhadi (2012). The Effectiveness of the PODE Strategy Based on Active Learning in Developing Generative Thinking Among First-Year High School Students. Journal of Scientific Research in Education. 2 (13).
11. Hadeel Alaa Kamel (2024) The Effect of a Strategy Based on the Theory of Triarchic Intelligence on the Achievement of First-Year Middle School Female Students in Physics and Their Generative Thinking. Master's Thesis. College of Basic Education. Al-Mustansiriya University.
12- Sternberg & grigorenko(2004) .successful Intelligence in the classroom. Theorry in to practice .

Appendix (1)
((Generative Thinking Scale))

Strongly Disagree	Disagree	Sometimes Agree	Agree	Strongly Agree	Items	.No
					I boldly present my ideas regardless of others' opinions	1
					I find it difficult to change my convictions	2
					I find that my ideas are in harmony with my peers' ideas	3
					I disagree with those who are not convinced by my ideas	4
					I believe my ideas are better than my peers' ideas	5
					I hesitate to ask about something that seems unreasonable or unclear to me	6
					'I believe my ideas are better than others ideas	7
					My life is shaped by society, not by my own ideas	8
					I am attracted to new ideas in various aspects of life	9
					I believe that being influenced by new ideas obscures my national identity	10
					I feel enjoyment during the lesson	11
					It is difficult to receive feedback during the lesson to correct my mistakes	12
					The instructor engages all students in learning the new skill	13

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

					The lesson duration does not facilitate the required learning of the new skill	14
					The instructor uses a display screen and video films when teaching skills	15
					The instructor gives us freedom to ask questions and engage in discussion	16
					The lesson time is not suitable for me	17
					The lesson is characterized by activity and vitality	18
					I continuously receive support and encouragement from my peers	19
					Every problem I encounter is an experience that develops my personality	20
					The existence of problems in life is a very natural state	21
					I believe that every problem, no matter how complex, has a solution	22
					,Sometimes I leave my problems to time as it is the guarantor of their resolution	23
					I face my problems calmly	24
					Before solving a problem, I identify its causes	25
					The problems I face negatively affect my mood	26
					I sometimes avoid confronting problems	27
					I feel anxious with every problem I face	28
					I believe that truth always prevails over falsehood	29
					I spend too much mental energy thinking about spiteful and mean people	30
					I think too much about envious people	31
					Beautiful things in life are more than ugly ones	32
					I feel anxious about my academic future	33
					I feel that life pressures are stronger than my abilities	34
					I pay attention to trivial matters I encounter in my life	35
					I distance myself from anyone who complains and grumbles about life	36
					I accept others' apologies after they have wronged me	37

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

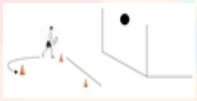
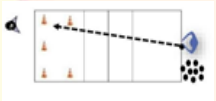
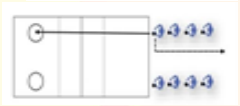
					I am pleased by my peers' distinction and others' success in life	**38**

Appendix (2)
Sample Lesson Plan Using a Tri-Intelligence-Based Strategy
Unit Objective: To learn passing skills **Duration: 90 min**

By the end of the lesson, students will be able to: -Analyze the technical steps involved in the serving skill -Develop a variety of movement solutions to direct their serves in a way that suits changing game situations -Demonstrate a spirit of cooperation and teamwork through group participation	**Behavioral Objectives**
,volleyball net – volleyballs – colored cones and hoops – whistle – illustrated boards .photos and videos – ropes or colored ribbons	**Equipment and Tools**
-Introduction (4 min): Line up, take attendance, perform the athletic salute, and set up equipment. -General Warm-up (8 min): General warm-up for all parts of the body. -Skill-Specific Warm-up (8 min): Skill-specific warm-up to prepare the muscles involved in the serving skill.	**Preparatory :Section min(15)**
Analytical and Creative Thinking 1. Introduction (Reviewing prior knowledge of the volleyball serve) 2. Organization (Dividing students into small working groups) 3- Activation (Placing students in a problem-solving situation / e.g., Imagine that the opposing team is focusing on a specific area; devise a tactical solution to serve the ball into open spaces Student's role: Generate new tactical ideas and test them in practice.	**Main (60)Section min** **Educational (15) :Aspect min**

Organization	**Exercises**	**Time**

Proximus Journal of Sports Science and Physical Education
Volume 3, Issue 05, May 2026
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

   	3. Execution (Practical Intelligence) Executing the prepared passing drills; transforming ideas into physical action Student's role: Use on-field intelligence to adapt to the conditions of the drill and achieve the best accuracy. The drills are as follows: - Perform a serve against a wall from a distance of (3-6-9) meters toward a target marked on the wall at a height of (2.40) meters. The student performs the serve from the first cone, runs toward the second cone, and then to the third cone to repeat the same action - The student stands behind the service line with ten balls beside them. Upon hearing the whistle, they serve to targets designated by the instructor. - The student stands behind the service line and serves upon the whistle; the ball must clear the net and land in the ring located on the designated court. - Performing the motor skill using a ball suspended in front of the student.	**(10) min** **(10) min** **(10) min** **(15) min**	**Applied (45) :Aspect min**
4- Information encoding: Reinforcing information to facilitate its transfer to long-term memory **5-** Assessment: Identifying strengths and weaknesses to address weaknesses and reinforce strengths. **6-** Follow-up: Praising correct performance - Relaxation and calming exercises, concluding the lesson with a quick summary of what was learned during the instructional unit.			**Concluding)Section:)15 min**