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Haider Mahdi Darwish
College of Physical Education
and Sport Science, Wasit
University, Iraq

Rusil Salam Gaber
College of Physical Education
and Sport Science, Wasit
University, Iraq

Milad Saeed Radhi
College of Physical Education
and Sport Science, Wasit
University, Iraq

Corresponding Author:
Haider Mahdi Darwish
College of Physical Education
and Sport Science, Wasit
University, Iraq

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The effect of the I.P.A.G.A model on information processing and learning the skill of defending the volleyball court among students of the college of physical education and sports sciences

Haider Mahdi Darwish, Rusil Salam Gaber and Milad Saeed Radhi

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Abstract

The purpose of this paper is to preparing educational units using the I.P.A.G.A model for the skill of defending the volleyball court, and identifying the effect of the I.P.A.G.A model in processing information and learning the skill of defending the volleyball court among students. The researchers used the experimental method with an experimental and control group, and the research community was represented by second-stage students for the academic year (2023_2024), numbering (80) students. As for the information processing scale, it was dealt with in sequential steps and statistical treatments to be compatible with the sample. Then the researchers prepared educational units, one educational unit per week at a rate of 5 units for a month and a half. The researchers concluded that the model provides sufficient opportunity through educational means that increased the learning process. It also allowed learners to engage the senses of hearing and sight through various educational means and methods that removed stagnation and boredom among students. Increasing students' experience with practice and repetition helps them to accurately develop new movements correctly. The researchers recommended the necessity of combining the theoretical and kinetic aspects when performing the skill. Emphasizing cooperation between students in order to process information for students and learn effectively by introducing visual aids in a different way in order to see the parts of the movement in detail due to its importance in linking the senses of hearing and sight.

Keywords: I.P.A.G.A model, information processing, defense skill, volleyball

Introduction

The current era has witnessed an increase in scientific knowledge and development in its application in all fields, including education, as Najla Abbas and others (2023) ^[12] indicate that the knowledge explosion and technological progress in various areas of life have forced educators to think deeply about harnessing this technology in the service of the educational process. This development has been reflected in teaching methods and approaches in the field of physical education and sports, and it has become necessary to apply them to keep pace with the rapid development, as see that "the teaching process is the cornerstone of the desired behavior of individuals and their acquisition of knowledge, values, customs and other behavioral patterns." (AL-Zuhairi *et al.*, 2023) ^[1]. "Therefore, the interest in the diversity of models and methods used in the field of teaching scientific subjects in general and mathematical sciences in particular has become very important and transfers them from the prevailing concept that does not care about employing the learner's thinking and mental abilities in the educational process, and the learner's needs and cognitive abilities are not taken into account, which are represented by the acquisition of concepts and higher mental abilities such as information processing. The importance of the study comes from the application of a modern teaching model that works to develop scientific and mental knowledge in the student and increases interaction with scientific situations, and provides him with the basic pillars in order to develop methods of thinking and processing information and provide a beloved educational environment for them. The I.P.A.G.A model is one of the teaching models that are based on knowledge and based on cognitive theory, which is one of the theories that explain the phenomenon of learning, and is concerned with internal

cognitive processes, such as understanding, reception, and information preparation, and is concerned with the cognitive mental process and explains the phenomenon of learning within the framework of the relationship between the stimulus and the response to the stimulus. Each person has his own style in processing information and is affected by his upbringing and motivation. And the capabilities and scientific level. Information processing is defined as "a cognitive mental process represented by the stages that information that comes from the surrounding environment goes through, so it is stored, organized and encoded in a complex neural brain processing in order to produce a directed response, and that the direction of information processing focuses on how to deal between the individual and environmental events, and how to encode the information that is learned and integrate the information that is in the memory and store new knowledge in the memory and retrieve it when needed." (Wissam Salah Abdul Hussein, 2015) [2].

Volleyball is one of the team games that contain defensive and offensive skills that attract many fans, and learning the skills of this game takes a long time through clarification and explanation. Students find excitement, enthusiasm, suspense and fun with the competition factor. It is characterized by many skill and movement requirements and duties that students must learn and master its technical aspects. indicate that volleyball "is characterized by the specificity of skill performance, as it requires collective harmony among students, and this always requires new and modern models to develop and master the performance of skills, especially the skill of defending the field." (Dunia Ali Abdul-hasan Saleem Najlaa Abbas Al-zuhairi, 2024) [4].

By observing the researchers of the second stage students in the college, they noticed that there is a fluctuation in the performance of the skill of defending the field and what this skill requires in terms of skill and mental abilities and its implementation is difficult. Hence, they found that one of the important things is the use of modern methods and models that have the ability to provide students with educational concepts, knowledge and information that develop their minds and solve problems related to diversity and linking to methods and the educational curriculum in a cognitive manner that helps in processing information. Therefore, the researchers tried to experiment with the cognitive I.P.A.G.A model to teach the skill of defending the field because it is a modern teaching model and to identify the extent of its impact on information processing for second stage students.

Research objective

- Preparing educational units with the I.P.A.G.A model to learn the skill of defending the field in volleyball for second stage students.
- Identifying the effect of the I.P.A.G.A model in processing information and learning the skill of defending the field in volleyball for second stage students.

Research hypotheses

- There are no statistically significant differences between the pre- and post-results of the information processing scale and the field defense skill for the control and experimental research groups

- There are no statistically significant differences between the post-results of the information processing scale and the field defense skill for the control and experimental research groups

Research methodology and field procedures

Research Methodology

Choosing the method that is compatible with the nature of the study problem is considered one of the basic requirements in scientific research. The researchers used the experimental method in the style of the control and experimental group with the pre- and post-test in a manner that is compatible with the research problem, as the experimental method is considered "the method through which we control an independent variable (or variables), and we observe the effect of this control on a dependent variable or variables." (Haneen Maysam Abbas Al-Saadi Naglaa Abbas AL-Zuhairi, 2023) [5].

Community and sample research

The research community is the second-stage students at the College of Physical Education and Sports Sciences / Wasit University for the academic year (2023_2024), whose number reached (80), as the research sample was selected from the community and the number of the experimental sample reached (30) students and was divided into two groups, the experimental (15) and the control (15).

Devices, tools and means used in the research experiment

- Legal volleyball court.
- Video camera (z5) - Whistle for referees
- Camera stand for filming number (1)
- Compact discs (CD) number (3).
- Colored adhesive tape.
- Volleyballs (12)

Field Procedures

The number of weekly units allocated to second-stage students in the College of Physical Education and Sports Sciences at Wasit University was consistent. The researchers also relied on conducting a technical performance test for the skill of defending the field in volleyball. "The tester performs the skill of defending the field from a standing position and for three consecutive attempts. He places a chair behind the net (on the opposite side of the half of the field in which the tester is located) for the coach to stand on and direct a crushing blow to the tester player. With the presence of three evaluators to evaluate the attempts for each student and three degrees are awarded for each expert, noting that the final evaluation degree for each attempt is (10) degrees distributed among the skill sections: the preparatory section (3) degrees, the main section (4) degrees, the final section (3) degrees. After that, the highest degree is chosen for each evaluator. While extracting the arithmetic mean of the best three degrees, the final degree is extracted for each tester student (Al-Dulaimi, Nahida Abdul Zaid, *et al.* 2015) [16].

Information Processing Scale

The researchers used the (Schmeck scale) consisting of (62) paragraphs classified into four sub-axes (the deep processing axis consists of (18) paragraphs related to students' organization, classification and analysis of

information in order to understand it accurately and deeply and work on evaluating and criticizing it. The second axis is the methodological study axis and consists of (23) paragraphs related to how students organize time and effort during studying and how to prepare for exams. The third axis is retaining scientific facts and consists of (7) paragraphs related to how the student is able to store information in the brain and retrieve it when needed. The fourth axis is detailed and expanded processing and consists of (14) paragraphs related to the student's ability to expand on the material and add it and how to express ideas in a special style and apply them directly). As for the correction method for the (Schmeck) scale, the researchers relied on the scale key (binary response), which is whether it applies to it or not, where the positive paragraph is of a degree (one) for the paragraph that applies to the weight, but if it does not apply to the answer, it gets (zero). As for the negative paragraphs, the weight is the opposite, where the paragraph that carries the answer that applies to the weight is zero, and the paragraph that does not apply to the weight is one degree. Where the highest degree for the scale is (62) degrees. The researchers conducted the scientific foundations of the scale, first the validity of the scale, where they verified the validity using two types of validity, which are content validity, as they distributed the scale to experts and specialists, and they also extracted self-validity with a degree of (0.83). Secondly, the stability of the scale. To verify the stability of the scale, the split-half method was used. To find stability, the researchers relied on data from a sample of (10 students), as the value of the stability coefficient was (0.81), which is a good stability coefficient. Thirdly, objectivity was found. The researchers distributed (five) forms to five correctors. After that, the same forms were distributed to five correctors. The relationship between the two results was extracted. The correlation between the two results was (0.87). Through this, it is clear that the scale is objective and the scientific foundations have been verified.

Pre-tests

A test for the information processing scale and a test for the technical performance of the field defense skill were conducted on Tuesday (19-3-2023) at the College of Physical Education and Sports Sciences.

Method work of model

After reviewing the references and scientific sources, scientific consultation and personal interviews with the specialist, the researchers began preparing the special units according to the I.P.A.G.A model for the experimental group to improve and process information and learn the field defense skill in volleyball. The researchers have determined the educational units as (5) units, according to their suitability with the vocabulary of the second stage, and one educational unit was determined every week on Tuesday, and the educational units started on (26-3-2024) to (23-4-2024). The unit time was determined as (90) minutes and divided into three sections, where the preparatory section time was (20 minutes) and includes the first step of the model steps, which is the introductory step or introduction and its time is (10) minutes. The researchers carry out this step by preparing and preparing the students' minds in order to receive new knowledge and information, as the teacher begins to retrieve the information and

previous experience with the students and to know what the students already know, both the old information and concepts stored in the memory and are stimulated. This is done by introductory with general questions related to the lesson and linking the current lesson to the past lesson. The students' attention is drawn, focused and stimulated about the current topic, and the teacher learns about the previous experience and information stored with each student in order to benefit from it in teaching. And general and specific warm-up (10 minutes). The main section (D65) consists of two sides: the educational side (10 minutes) and consists of a step of presentation methods. Educational methods represented by (educational posters) were adopted, as they are considered the most prominent means that can be employed effectively in evaluating students' behavior and conveying important information in a concise manner. They are characterized by having one main goal that is clear and expressive, colorful to attract attention, large and simple so that it can be seen from a distance and understood quickly by simply looking at it. It gives students the opportunity to practice mental activity and prepare them for educational situations and activities in order to participate in the learning and teaching process. The presentation of information or examples must be in a clear and understandable language that is appropriate to the students' intellectual and cognitive level. The teacher maintains the students' interest and focus continuously by asking questions.

The use of computer and plasma screen for display, educational images and films, and videos of the educational unit are displayed according to the subject and purpose of the educational unit, and its duration ranges from (2-5) minutes, and the researchers took care to make it easy and smooth, and the researchers also chose this method because it combines the moving image and diversity in movement to avoid boredom and attract the attention of students and display images and models that contribute to understanding the information and review and the possibility of stopping the film and repeating it and controlling the speed of the film display, it can be made very slow to know the details of the movement, and thus the alternative may involve more than one sense in students, as it allows the learner to remember the information for the longest possible period. As for the practical aspect, it consists of (55 minutes), and this aspect included the other three steps, which are the linking step, its duration is (12 minutes), the teacher tries to help students analyze knowledge and link new ideas and compare them with their old ideas and concepts through similarity and interconnection between them, and encourages students to work as a team to reach the best performance by giving students appropriate and new examples that make students think in a new way. And providing feedback and correcting performance. Thus, this link helps students to consolidate information in their minds, whether by watching the astronomy or the video, and makes, each student rely on himself to search for solutions and overcome the problem he faces.

The generalization step (12 minutes) The teacher gives students the freedom to choose their moves that are an alternative in order to reach the best performance according to their understanding and capabilities that they have reached, and to form a general idea for students from the fragmented ideas and move from examples to the general rule and raise, clarify and discuss the problems that students face when applying the performance in the previous stage

and reach the results. The teacher explains the appropriate explanations in order to reach a solution to the problems and the student does not fall into the same mistake during the performance, as the teacher leaves the students the task of formulating ideas and conclusions in the special style of each student, thus increasing the student's self-confidence, and the teacher provides guidance and correction when needed.

The application step (31 minutes) The teacher divides the students into groups to apply the skill of defending the field and the teacher encourages the students to apply the performance and explains to them the rules and generalizations in the form of examples and identifying the problems. The teacher corrects errors and gives feedback to students during performance. The application of the skill that students have reached through the previous steps is freer. Observing the performance has become developed and improved. Feedback is given in order to correct errors and

evaluate performance. At the end of each educational unit, the teacher gives the opportunity to ask questions and give calming and relaxation exercises and leave.

Post-tests

After completing the main experiment, the researchers conducted the post-tests on Tuesday (30-5-2024) under the same temporal and spatial conditions to extract the results that the researchers reached.

Statistical methods: The researchers used the statistical package for social sciences system to extract each of (Arithmetic mean, percentage values, standard deviation, simple correlation coefficient (Person) and skewness coefficient).

Results and Discussion

Results

Table 1: Shows the arithmetic means and standard deviations of the pre- and post-test for the experimental and control research groups.

Groups	Variables	Pre-test		Post-test	
		Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
Experimental	Information Processing	24.07	2.95	30.13	2.81
	Defending the court	3.53	1.09	5.93	1.42
Control	Information Processing	24.20	2.75	26.02	2.91
	Defending the court	3.50	1.82	4.56	1.92

Unit of measurement (Degree) Degree of freedom (14)

Table 2: Shows the arithmetic means of the differences and the T value between the pre- and post-tests for the control and experimental research groups.

Groups	Variables	Arithmetic mean of difference	Standard deviation of differences	T value calculated	T value tabular	Type Sig
Experimental	Information Processing	6.06	2.27	10.27	2.14	Sig
	Defending the court	2.4	1.23	8.89	2.14	Sig
Control	Information Processing	1.82	1.14	6.28	2.14	Sig
	Defending the court	1.06	0.23	7.57	2.14	Sig

Unit of measurement (Degree) Degree of freedom (14)

Table 3: Shows the results of the post-tests for the experimental and control research groups

Variables	Experimental		Control		T value calculated	T value tabular	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation			
Information Processing	30.13	2.81	26.02	2.91	4.91	2.06	Sig
Defending the court	5.93	1.42	4.56	1.92	2.21	2.05	Sig

Unit of measurement (Degree) Degree of freedom n-2 (28)

Discussions

It is clear from the above tables that there are significant differences between the pre- and post-tests in information processing and technical performance of the skill of defending the field. The researchers attribute this improvement to the presence of educational tools that helped in learning and responding in a better way. This is what Haya Abdul Rahman and others indicated, "The interactive role of the auxiliary tool by explaining how to link the parts of the movement and benefit from it will help them respond to many variables and lead them to solve the problem." (Heba Salah Abdul Mohsen, Milad Saeed Radhi, Haider Mahdi Darwish. 2024) [7].

Also, using the means to display posters and scientific films in the presentation stage is considered a means to provide information to students and encourage them to be excited and thrilled and to remove boredom and weariness and gives students the opportunity to process information and work individually and collectively and solve problems by linking

ideas and evaluating performance and choosing the appropriate alternative. This is consistent with what "The method that uses modern educational means increases the student's positivity towards the lesson and excitement and thrill among learners and motivates them to acquire experiences and knowledge in a more effective way and makes the lesson more lively and thus is reflected on learners in the form of different and accumulated experiences." (Mohamed Saad Zaghloul *et al.*, 2001) [8]. Believes that "students searching for information, finding relationships between exercises and their elements, asking questions and ideas, finding solutions, and then evaluating performance, makes them have intellectual skills, and students are required to link ideas within the scope of the lesson and choose available alternatives on how to solve the problem." (Mustafa Waleed Al-Fahdawy, Haneen Maisam Al-Saady, & Ahmed Jamal Al-Fahdawy. 2024) [9].

Also, making the learner a participant in the educational process by applying exercises through the stages of linking,

generalization, and application independently is considered an encouraging factor for students by increasing their drive to perform freely, enhancing self-confidence, and improving their view of themselves, thus increasing motivation, boldness, and challenge to meet performance requirements and provide a good level. This is consistent with the fact that caring for the learner and making him the focus of the educational process and the center of his opinions and abilities with sympathy, acceptance, and encouragement is an essential factor for learning.

When the player is the focus of the educational process and is given the freedom to express his opinion without fear or hesitation, this is reflected positively in generating and discussing ideas and opens the way for him to deep understanding and thus improves his level of performance of skills and contributes to increasing the player's knowledge and increasing the cognitive structure and increasing his ability to use experiences in the situations he faces. Researchers also attribute that the difference in ability to process information through the model helped students to think and since information processing is "a mental process and the results of a series of cognitive processes that mediate between receiving the stimulus and responding to it" (Yahya Obaid Radam. 2015) ^[10]. Also, the work of information processing is to receive stimuli from the external environment and store and organize them in the brain to benefit from them and use them at the appropriate time and thus helps students to increase the ability to process information Giving feedback to students facilitates their learning of the skill, corrects their paths, gives them motivation to perform, improves comprehension and understanding of performance in less time, and this is what he indicated, and "giving them feedback had a positive impact on forming the correct performance, stimulating motivation, and saving time and effort, as learning any skill requires focus and attention from the teacher." (Al-Sade, Haneen Maysam abbass; AL-Zuhairi, Najlaa Abbas) ^[11]. Feedback "contributes to correcting the academic path of students, developing skill performance, reducing errors, and encouraging them to integrate." (Hanin Maisam Abbas, & Najlaa Abbas Nseif. 2023) ^[12].

Conclusions and Recommendations

Conclusions

- The model provides sufficient opportunity through educational means that increased the learning process.
- The model allowed the involvement of the senses of hearing and sight through various educational means and methods that removed stagnation and boredom among students.
- Increasing students' experience with practice and repetition helps them to accurately develop new movements correctly.
- Explaining, presenting, and applying the skill in the main part of the educational and applied sides of the educational unit increases learning Skill.

Recommendations

- The necessity of intervention and combination between the theoretical and kinetic aspects when performing the skill.
- Emphasizing cooperation between students in order to process information for students and learn effectively.

- The necessity of introducing visual means in a different way in order to see the parts of the movement in detail due to its importance in linking the senses of hearing and sight, and thus leads to acceleration in the learning process and improvement of skill performance.

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Appendix (1)
Shows the scale paragraphs

No.	Paragraphs	Applies to me	Does not apply to me
1	I have difficulty dealing with questions that require comparing different concepts.		
2	I have difficulty reaching conclusions.		
3	I have difficulty organizing the information I remember.		
4	I have difficulty remembering the material I have studied carefully during an exam.		
5	I have difficulty answering questions that require critical evaluation.		
6	I answer essay exams well.		
7	I often have difficulty expressing my ideas in appropriate words.		
8	I have difficulty learning how to study for a particular subject.		
9	I have difficulty planning my studies when I encounter complex subject matter.		
10	I get good grades on my reports.		
11	I often memorize material I don't understand.		
12	I have difficulty noticing differences between ideas that seem similar		
13	I can usually decide the main meaning of the films I watch and the books I read.		
14	I think quickly.		
15	Most of my teachers give their lectures very quickly.		
16	I can usually guess well, even if I don't know the correct answer to exam questions.		
17	I ignore the differences between information obtained from different sources.		
18	I read critically.		
19	Summarize as much information as possible for exam purposes		
20	I have regular review periods each week.		
21	I find it difficult to start studying and reading my courses.		
22	I review the course material periodically during the semester.		
23	I keep a daily schedule of my study hours.		
24	I complete all my assigned schoolwork carefully.		
25	I often write a summary of the material I read.		
26	I spend more time studying than most of my friends		
27	I prepare many notes for the course from several sources.		
28	I often read more than what is given in class		
29	I often refer to multiple sources to understand the idea		
30	Summarize all the material I have studied as I approach the end of the semester or school year		
31	I increase my vocabulary by preparing lists of new terms		
32	I use the dictionary (or thesaurus) on a regular basis		
33	I continue to study the material even if I have mastered it		
34	I draw shapes and make simple diagrams to help me remember the material.		
35	I always make an exceptional effort to obtain all the details and appendices related to the subject matter.		
36	I study by solving practical exercises.		
37	I have a fixed place to study.		
38	بإستطاعتي العثور بسهولة على النصوص الواردة في الكتب المنهجية عندما يتطلب ذلك .		
39	دائماً أفضل قراءة المقال الأصلي بدلاً من خلاصته		
40	استخدم المكتبة باستمرار عندما أقرأ للاختبارات		
41	أعد قائمة بالأسئلة المحتملة وإجاباتها		
42	I answer well on exams that require facts from the textbook		
43	I learn equations, names and dates very well.		
44	I answer well on exams that require definitions.		
45	I answer well on exams that require completing the solution and missing information		
46	I have difficulty remembering definitions.		
47	I can say that my memory is very weak.		
48	In exams, I memorize the material by heart as it is in the book or in the lecture notebook.		
49	I constantly search for the reasons behind the facts.		
50	New concepts make me think about similar concepts.		
51	Through my studies, I try to find answers to the questions that are in my mind		
52	I usually design my own ways to solve problems.		
53	After reading any study material, I reflect and think deeply about the Appendices and topics I have read.		
54	I learn new words and ideas to imagine a situation in which they could occur.		
55	When I learn a lesson from the material, I summarize it in my own style.		

56	I learn new concepts by expressing them in my own words.		
57	I always mentally review the topics I study during the day.		
58	When I study, I design a system to remember the material.		
59	I associate new words and ideas with words and ideas I already know.		
60	I learn new ideas to compare them with similar ideas.		
61	I turn facts into laws that I extract from my experiences and experimentation.		
62	When learning new concepts, I often put them into scientific applications.		