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Zahorek Model Using Mind Maps and its Impact on Learning the Skills of Rolling and Handling for Middle School Students Aged 16-17 Years

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Abstract

The study's goal is to determine how well 16–17-year-old middle school students learn rolling and handling abilities when taught utilising a mind map-based instructional strategy based on the Zahoric model. An experimental strategy was employed by the researcher. One hundred and twenty-two male students from Al-Jawahiri Preparatory School for Boys made up the study's community. A total of thirty students from the experimental group and thirty students from the control group made up the research sample, which was chosen using a basic random method (lottery). The exploratory experiment's sample size was fifteen students, with eighteen individuals left out of the research group. Over the course of eight weeks, participants met twice a week on Sundays and Tuesdays for instruction. Researchers found that middle school students (aged 16–17) benefited greatly from employing the Zahorek model, which makes use of mind maps, to acquire the abilities of rolling and handling throughout the 45-minute session. The researcher suggests expanding the current study to include more mathematical abilities and a wider range of ages and academic levels.

Keywords: Zahorek model, maps, rolling and football handling.

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1. Synopsis

The objective of the research is to ascertain the influence of an educational curriculum employing the Zahorek model with mind maps on the acquisition of rolling and handling abilities among middle school students aged 16 to 17 years. The research cohort comprised 102 students from Al-Jawahery Preparatory School for Boys. The research sample was selected using a basic random procedure (drawing lots), resulting in an experimental group of 30 students and a control group of 30 students. The survey experiment sample consisted of 15 students, whereas 18 students were omitted from the study community. The educational program lasted eight weeks, with two instructional units conducted weekly on Sundays. The module lasted 45 minutes, and the researcher concluded that the application of the Zahorek model utilizing Mind Maps significantly enhances the development of rolling and handling skills among middle school students aged 16-17. The researcher recommends leveraging modern teaching models to support and improve the educational process.

2. Introduction and importance of research

The world is currently seeing a great increase in science, including mathematical sciences, and the concept of good teaching has a broad area in education, which calls on workers and managers in this vital field to pay actual attention to setting the paths of progress and development of the educational process. There are many future paths; hence, selecting the appropriate teaching approach is what achieves part of the goals of the educational process and guides it in the correct direction that keeps pace with development; that is, teaching methods are the ones that provide the right atmosphere and freedom in choosing the appropriate educational environment to be able to achieve educational goals.

One of these is the Zahorek model, which works to create a clear understanding of duties so that makes these attitudes effective and fruitful at the same time, and the multiplicity in the use of different teaching methods for learning does to lift boredom from students resulting from the use of one method, so it requires us to look for methods that accelerate the learning process, especially those that give a prominent role to the learner. There are many methods that help to speed up learning and acquiring motor skills. The mind map has become widely used in the educational field because of its rare qualities. It introduces students to the interconnected network of interrelated relationships between various aspects of the topics of the subject to be presented. This technique works to improve the process of teaching and learning in various studies. It is a wonderful pattern that is taken on a board whenever you like it with one sheet of paper with an organized appearance in which words are replaced with pictures or drawings that refer to it in a short, beautiful and easy to remember way. It is also a tool and technique that helps to condition concepts along a topic in a sequential, coordinated and artistic pattern similar to the work of the human brain because the learner goes through two stages, one is the role of the learner and the other is the role of the teacher.The learner also needs to think and focus without distractions and to reconcile the work of the musculoskeletal and nervous systems to harness the previously acquired knowledge and employ it to improve neurological control, which is in changing the meaning and educational situation as a result of this experience and also needs to diversify the methods if a successful and fruitful model is to be found in the guiding process . The sport of football, which includes many fun and varied activities, and learning the basic skills of this game takes a long time of explanation and clarification, especially since this game is practiced in secondary schools, where students find fun, enthusiasm and a sense of competition. In view of the above, physical education teachers must choose the best teaching methods to improve the basic skills better for games in general and football in particular through the methodological lesson as soon as possible and with less effort. Hence the importance of research. In knowing Zahorek's model using mind maps and its impact on the development of learning the skills of rolling and handling football for students.

The research problem summarizes the models and methods of learning from the affairs that result in an important concern in encouraging the educational process, which is confirmed by the response

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between the teacher and the student. The delivery of information from the teacher to the student is the approach on which the education process depends, as the more this means is appropriate, the good the education process will be. The use of the Zahorek model, and what these models provide is that these models take into account the individual differences between learners, address them in appropriate ways for students and other features that make them better than others, and through a general vision of the nature of the output of a lesson. The researcher notes that the method followed by the teacher is based on compliance and working according to the model followed , as well as the lack of interest in the theoretical presentation in skills education. This is not in line with our generation today of a cognitive explosion, which requires searching for more sophisticated methods and educational models. Therefore, the researcher decided to use the Zahorek model using mind maps and applying them in our lessons as it is a modern model in the hope that it will bring positive results in the development of some of the skills of rolling and handling football among students for the purpose of helping the learner to draw a correct cognitive picture in the brain and think about movement before performing it and using it in building the motor program of skills under research.

3. Study Purpose

1. Preparing an educational program according to the Zahorek model using mind maps and its impact on learning the skills of rolling and handling for middle school students aged 16-17 years.
2. Identify the effectiveness of the Zahorek model using mind maps and its impact on learning the skills of rolling and handling for middle school students aged 16-17 years .

The terminology is:

2.1. Teaching Model

It is a guiding system based on a specific educational theory and recommends a set of knowledgeable and consistent procedures that guide the implementation of teaching and learning activities in a way that facilitates the achievement of cognitive, emotional and behavioural educational purposes. Educational models help the teacher to plan and conduct their educational activities in an appropriate classroom atmosphere that ensures effective education, which is reflected in the learning process. It is also a guiding system that relies on a specific educational theory and proposes a set of specific and organised procedures that guide the process: (20.1)

2.2. Zahorek Model

Defined by (Yassin and Zainab 2012) as " an educational model based on constructivist theory in five basic stages based on mobilising knowledge, gaining knowledge, understanding knowledge, using knowledge, and thinking about knowledge" (112.11)

2.3. Mind Maps

" It is one of the creative and innovative ways to record comments, which draws the concepts of the person, develops comprehensive plans, and uses fonts, symbols, words and images to lay down basic and natural foundations and rules preferred by thought" (25.4).

4. The Concept of Mind Maps

“It is a visual thinking tool that is an important language in planning ideas. It is a process of organising and is easy to remember. It clarifies the relationships and links that the student has cooperated to realise by seeing them through a set of mental maps that develop the ingenuity of thinking. It is a method that teaches learners the ingenuity and ability to find and analyse correlations, as well as set priorities and develop plans for their theories in an objective scientific way. Mind maps are used in many guiding and educational situations in many school tools. The student's ability to use knowledge maps gradually develops” (102.10)

5. Method and Procedures

5.1. *Research Methodology*

The researcher used the experimental pattern in the style of the two equivalent experimental and control groups with pre- and post-tests to suit the nature of the research.

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5.2. *The research community and sample*

The research community was composed of the fifth grade students in Al-Jawahiri Preparatory School for Boys at the ages of (16-17) years, who numbered (102) students for the academic year 2023-2024, divided into (4) divisions, which are (A, B, C, D) , and the sample was randomly selected so that Division (B) represents the experimental group and (A) represents the control group with (30) for each division. As for the sample of the exploratory experiment, it included (15) students from Division (C), and the researcher excluded (18) members of the research community. Table 2 shows this.

Table 1: The research population, sample and percentage.

Research Sample	Number	Percentage
Control group	30	-0.411**
Test group	30	-0.411**
Sample Exploratory Experiment	15	.705
Excluded	18	647
Total	102	100%

5.3. *Homogeneity and symbiosis procedures for the two research groups (control and experimental)*

5.3.1. The Homogeneity

The researcher homogenised the research sample for some variables (height, weight, age, and intelligence) and reached the following results based on Table 2.

Table 2. The homogeneity of the sample members.

Variables	Measurement	S	Pr	Winding	Dalalah
Height		922	3,267	0.087	Homogeneous
Weight	[kg]	330	9,870	0.272	Homogeneous
Age	Year	931	677	260	Homogeneous
IQ	Grade	33-44	7.08	0***	Homogeneous

For the purpose of verifying the equivalence between the two groups in (rolling skills tests – handling). Table 3 shows the equivalence between the sample members.

Table 3. The equivalence of the sample.

	Control group		Experimentation		# Calculated	Sig	Type of indication
	C	Pr	H	Pr			
Anti-roll	763	0.688	698	0.727	0.265	0.779	immaterial
Outsourcing	3.790	775	4 A/107.	763	0.469	0.646	immaterial

Table T (58) and indicative (0,05) = 2.002

5.4. *Tools and methods*

5.4.1. Means of Information Acquisition

Arabic Resources 2- Tests. 3- Scientific observation.

5.4.2. Used tools and devices

1- poles 2- legal football 3- measuring tape 4- medical scale

5.5. *Characterisation of tests*

5.5.1. The first test: - Test name: "Rolling for a distance of (10)m (149.3)

Objective of the test: To evaluate the technical performance of the laboratory when rolling the ball.

Tools used: Football (3), Spray Paints, Whistle, Tape Measure, Sticks (4).

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Testing procedures: The starting path is drawn along (meters) m and ten meters from the finish line. We put (3) balls on the start line to wait for the direct signal from the teacher. Method of implementation: The player stands behind the start line and starts when the signal is given to roll to the finish line. Each player is given (3) consecutive attempts to score a test: the best attempt is calculated for each of the three attempts and for each rectifier from those collected from the rectifiers, and the arithmetic mean is calculated..

5.5.2. Test Name: "Handling towards a small target distance of (20)m" (average) (150.6)

Objective of the test: Evaluating the technical performance of the laboratory when performing the skill.

Used tools: five footballs, a goal (110-63cm), sprays, and two poles.

Test procedures: A path is planned to start with an extension of (1) meter on an area of (20)meters from the goal, and (5) balls are used on the starting line.

Method of performance: The player stands behind the starting line facing the small goal, and when the signal is given by the teacher, the ball begins to be handled towards the goal to enter it, and each player is given five consecutive attempts. Test scoring: The best attempt is calculated for each of the five labs, for each evaluator, and then for a group of evaluators, and the arithmetic mean is calculated.

5.6. *Exploratory experiment*

On 4-10-2023, Wednesday, the researcher conducted the exploratory experiment in Al-Jawahiri Preparatory School for Boys on 15 students. The purpose of the experiment was to identify the obstacles that will affect the progress of the main experiment and to identify how to apply the means and devices used, as well as the application of the test, for the purpose of ensuring the efficiency of the work of the assistant staff

5.7. *Scientific Basis for Tests*

5.7.1. Validity Testing

The researcher approved (self validity), which is measured by calculating the square root of the stability coefficient of the building in Table 4.

5.7.2. Stability

The stability of the test was confirmed by calculating the correlation coefficient (Pearson) between the results of the first test and the results of the second test, using the method based on Table 4.

5.7.3. Objectivity

The researcher resorted to the use of arbitrators(*) when conducting the exploratory experiment, which was conducted on a non-research sample and from the community of origin, as shown in Table 4.

Table 4. Arbitrators.

Test	Honesty	Reliability	Objectivity
Anti-roll	942	889	890
Outsourcing	0.935	875	0.898

5.8. *Pre-test*

The researcher conducted pre-tests for the experimental and control research groups on 11-12 /10/2023, on Wednesday and Thursday.

5.8.1. Tutorial

The researcher started the educational curriculum on 15/10/2023. The duration of the experimental curriculum was 16 units per week, two units. The time of the educational unit was 45 minutes , two units per week. in days. SUNDAY. Tuesday) and the mechanism of work was an explanation by the teacher of what is on the mental map hanging on the walls of the sports hall in each section of the educational unit. In light of the steps of the Zahorek model, after the orientation process, schools direct questions that the researcher has prepared in advance according to the type of skill. Mind maps are the

(*) Evaluators: 1- Dr Bashir Mohammed Farhan learned football – Ministry of Education.
2- Prof. Dr Ali Mohsen Dairi learned football. The Ministry of Education

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ways in which the learner relies on the educational process and are suspended in the form of a tree that guarantees ideas and helps the mental confusion to(education, training, planning, thinking and retrieval of information) and the mechanism of the Zahorek model is according to the five stages in the main section. Activating information, gaining information, using information and believing in information. The educational section includes two stages. The information is activated here. The skill is explained based on previous knowledge, clarifying the goal of the lesson, and using educational means that help activate and discuss students in previous information. At the stage of acquiring information, a skill is applied with an emphasis on not looking at hatred. The skill is explained in a holistic manner and not as parts. In the applied activity, which includes three stages of understanding information, the teacher uses competitive exercises and the stage of using knowledge, where the teacher emphasises the use of knowledge and information by performing the skill in a practical way. At the last stage, the knowledge of the skill is realised and used so that it is used in the application of a skill in practice by playing between two teams. The curriculum ends on 17/12/2023.

5.8.2. Post tests

The researcher applied the post-tests of the experimental group and the control group on 24-25 /12/2023, which happened on Sunday and Monday, with the help of the assistant work team and under the same conditions as the pre-tests that were previously proven.

5.9.*Statistical Methods*

The researcher used the means of statistics according to the ready-made statistical package (SPSS):

5.9.1. Presentation, analysis and discussion of results.

5.9.2. Presentation and analysis of results

Table 5 shows the value of (t) calculated for the rolling and handling skills in the tests (pre and post) of the Zahorek model using the mind maps of the control group.

Table 5. The value of the calculated (t).

	Pre-test		**Post-test**		**F**	**P E**	**Calculated**	**SIG**	**Type Sig.**
	C	**A**	**H**	**Pr**					
Anti-roll	763	0.688	865	1.189	1.171	0.245	4.423	0.008	corporate
Outsourcing	3.790	775	198	1 078	2.363	376	.054	0.007	corporate

Table T (58) and indicative (0,05) = 2.002

Table 6 shows the value (t) calculated for the rolling and handling skills in the tests (pre and post) of the Zahorek model using the mind maps of the experimental group.

Table 6. The value of the calculated (t).

	Pre-test		**Post-test**		**F**	**P E**	**Calculated**	**SIG**	**Dalalah**
	C	**A**	**H**	**Pr**					
Anti-roll	698	0.727	7.311	1.465	511	0.466	5.543	0.000	corporate
Outsourcing	4 A/107.	763	0.610	.721	0.317	0.310	532	0.000	corporate

Table T (58) and indicative (0,05) = 2.002

Table 7 shows the results of the arithmetic mean, standard deviation and the value (T) calculated for the control and experimental groups in the post-test of the research variables.

Table 7. The results of the arithmetic mean, standard deviation and the calculated value of (t).

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	Control group		Test group		# Calculated	SIG	Type Sig
	H	Pr	H	Pr			
Anti-roll	865	1.189	7.311	1.465	2.867	0.009	corporate
Outsourcing	198	1 078	0.610	.721	3.976	0.007	corporate

Table T (58) and indicative (0,05) = 2.002

6. Discussing the results

The researcher believes, by observing Table (7), that there are significant differences between the experimental and control groups in the post-tests and for the benefit of the experimental group, that one of the factors that helped to learn and develop the skills of rolling and handling football for students for the experimental group and for the benefit of the post-tests for the students of the experimental group is to apply the educational curriculum according to the use of the Zahorek model using mind maps, which has a clear impact on the advancement of learning and make it more effective. The experimental group in the skill tests in question.

The researcher attributes the development and improvement that occurred to it in the performance of skills, which came the impact of education and repetition even linked to the performance of the skill to an advanced level of learning degrees, and this did not happen by chance or arbitrarily, but rather the phenomenon of the impact of the application of the guidance program in a systematic and effective manner, as (Muhammad Mahmoud Al-Heileh) confirms that "when the educational program is implemented effectively, the full performance of the student develops repeatedly and they can gain an additional benefit, which is the expansion of modern learning about the method of learning a skill, and this depends on their correct habit of the dependent method of learning the skill" (64.9). As well as benefiting from the skills of the stages of the Zahorek model or that helped to attract the attention of students and raise their interest and make the lesson more stimulating and expose them to new situations by answering the teacher's questions during the educational unit, and that the individual who lacks motivation in learning will never learn, and this is confirmed by (Wajih Mahjoub) "From the duty of learners to be motivated towards learning the skill until the end of learning, if the learner sees that the skill is not important or not liked, learning on the skill is limited (144.12). It contributed to raising the level of inclination of learners (students) and the learning process and increased their mental readiness towards the educational material and facilitated their learning and saturated their need for renewal and diversity in teaching methods, and this is what (Fidaa Akram) stressed that "teaching methods and methods are of great importance in the educational process and that these methods and methods affect the speed of learning and the degree of satiety in learning" (59.7) and that the use of the Zahorek model is more effective than the method used in teaching, so using it enables the student to think about the skill.

Before its performance, it tries to link different things or disjointed facts and reduce the smallest details. It also gave a greater role to the student in the educational unit, and this is confirmed by (Troxclair, Erdogan) that education models generate intellectual models and make the learner constantly challenge their thinking skills. Because it requires the student to use many different mental skills to communicate with dilemmas and find appropriate things for them, and this increases the student's learning of the skill, as the procedural skill results from the orders issued by the mind to apply them, and the more sound solutions resulting from correct learning and educational patterns that suit the learning of the mind, the better, 47.13).

And that the use of mental maps is a tool and technique that helps to develop concepts along a case in a sequential and consistent way and a technique similar to the work of the human brain, and is also an expressive means of ideas and studies instead of being limited to words only, as reefs, drawings and colors are used in expressing the idea and when the mental map depends on visual recall, which is the realistic way used by the human core in belief, which is a means that helps planning, learning and constructive thinking (178.2)

The use of the Zahorek model increased the motivation and suspense of learners in answering questions and competing in responding, as it provided students with the opportunity for dialogue and opportunities to discover their abilities, potentials and information about skills. It also provided opportunities for all

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students, or most of them, to reach a good stage of learning. This is through practice, and this is what Mohsen Ali stressed: "the Zahorek model can achieve a sense of pleasure and suspense among students and motivate them to practice thinking more seriously, so it takes root in them in an automatic pattern of concepts and then their learning increases. This strategy also activates previous knowledge as a basis for new learning and raises curiosity in thinking during the lesson." (175.8), as the group that used the Zahorek model using mind maps achieved positive and effective results in learning.

7. Conclusions and recommendations

7.1. *Conclusions*

In light of the research results, the researcher reached the following conclusions:

1. The use of the Zahorek model using mind maps has an effective impact on the development of learning rolling and handling skills for middle school students aged 16-17
2. The use of the Zahorek model using mind maps contributes to raising the level of learners' tendency in the learning process, increases their mental readiness, and satisfies their need for renewal and diversity in teaching methods.

7.2. *Recommendations*

Based on the results of the research, the researcher recommends the following :

1. Conducting a study similar to the current study on other mathematical skills at different ages and academic stages

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Appendix

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Sample Educational Module (Learning Football Handling Skill)

Learning Object	Time	Exercises	Notes
The Education Section	10 min Phase 1 Information Activation Phase 2 Learning	Demonstrate the skill of handling by performing exercises through the teacher for students. Here, all parts of the skill are displayed and the purpose of that meditation is to compare the previous information the student has what is seen to perform and then the student performs the skill handling and provides an opportunity for the student an experimental application to perform the skill handling and then display the skill handled by the teacher and then the learner looks for meditation to discover and compare internally and then apply about a skill free of errors At this stage, the teacher explains. How does the handling skill perform in detail from the player's standing? Place the resting foot next to the ball. How to move the knee, how to be the torso, how to use the arms and swing the leg	Baptism on the mental mess hanging on the walls of the sports hall in each section of the educational unit In light of the steps of the Zahorek model after the orientation process, schools direct questions that the researcher has prepared in advance according to the type of skill.
Applied Section	20 mins Stage 3 Understanding Information The fourth stage is the use of information The Last Stage: Evaluation in Maaroufat	The purpose of the performance and the application of the previous concepts that have been explained. Previously, with new concepts, the teacher does this during performance and dialogue. And the discussion between the learners to know the new concepts and at the end of the discussion and dialogue, the coach asks the players can you perform the exercises from other situations? At this stage, the teacher corrects the errors by giving feedback. By explaining performance in detail to students and making competition between students through participation in joint exercises Exercise 1 : Between one group, the distance between them is 5m, handled to the colleague and vice versa . Exercise 2: Between one group, the distance between them is 10m . Handling to colleague and vice versa The third exercise: Handling football to a circle of 3m diameter at a distance of 10m and then holding a football match between the three groups and giving feedback by the teacher to the students At this stage, the teacher evaluates the performance of the learners by performing the old activity. For example, the teacher divides the students into two teams and conducts a match. The teacher focuses on a learner application of all new concepts related to the skill of handling the ball that he learned from a teacher.	

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