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The Impact of The SWOM Strategy on The Achievement of Male Students in Preparatory Stage an Developing their Mathematical Power

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Abstract

The aim of the present research is to identify (the impact of the strategy of SOM (Swom) in the achievement of fourth grade students and the development of sports power on them). In light of the objective of the research, the researcher formulated zero hypotheses, and to verify the research objective and hypotheses, the researcher chose a preparatory Khalid bin Walid for boys of the Directorate of Education Salah al-Din Department of Education Tikrit deliberately as a place to conduct its experiment, and randomly selected two divisions (B, C) to represent the two research groups The experimental and control group was randomly assigned to represent the experimental group to study according to the SWOM strategy. Division (B) became the control group to study according to the usual method. Student group includes Experimental (32) students and the control group comprising (32) were verified parity between the two sets of search in the IQ test variables, the chronological age of the students measured in months, academic achievement for parents, former academic achievement of students in mathematics, mathematical test force. The experiment was applied in the first semester of the academic year (2018-2017) and the researcher taught the two research groups themselves by five classes per week for each group.

The researcher prepared on the two research groups after verifying the sincerity of its content, by presenting it to the specialists, and applied to a survey sample to ensure the clarity of its paragraphs and to ensure its stability using the alpha-Kronbach method, as well as its psychometric properties (discriminatory force, difficulty factor, effectiveness of alternatives). As for the measurement of mathematical strength, the researcher prepared a test consisting of (10) paragraphs, the researcher confirmed the validity of his paragraphs after being presented to the specialists and applied to the exploratory sample to find psychometric characteristics (discrimination factor). The researcher also used a number of statistical methods, including the T-test of two independent samples (test-t) to reward the two groups and to know the significance of the difference between them and the Alpha Kronbach equation to calculate the coefficient of stability for the test of achievement and the test of mathematical strength and the square of Kay to check the equivalence of the two research groups in the academic achievement of parents. 1. The experimental group students who studied using the Swom strategy outperformed the control group students who studied in the normal way by the achievement of statistically significant achievement at the significance level (0.05). 2. The experimental group students who studied using the Swom strategy outperformed the control group students who studied in the normal way by testing the mathematical strength at the level of 0.05). 3. There is a statistically significant difference between the scores of the experimental group students who studied using the Swom strategy on the pre and post mathematical strength test. In this light, the researcher reached a number of recommendations and proposals.

El Impacto De La Estrategia SWOM En El Logro De Los Estudiantes Varones En La Etapa Preparatoria Y El Desarrollo De Su Poder Matemático

El objetivo de la presente investigación es identificar (el impacto de la estrategia de SOM (Swom) en el logro de los estudiantes de cuarto grado y el desarrollo del poder deportivo en ellos). A la luz del objetivo de la investigación, el investigador formuló cero hipótesis, y para verificar el objetivo y las hipótesis de la investigación, el investigador eligió un Khalid bin Walid preparatorio para niños de la Dirección de Educación del Departamento de Educación de Salah al-Din Tikrit deliberadamente como un lugar

para llevar a cabo su experimento, y seleccionó al azar dos divisiones (B, C) para representar los dos grupos de investigación El grupo experimental y de control fue asignado aleatoriamente para representar el grupo experimental para estudiar de acuerdo con la estrategia SWOM. La división (B) se convirtió en el grupo de control para estudiar según el método habitual. El grupo de estudiantes incluye estudiantes experimentales (32) y el grupo de control que comprende (32) se verificó la paridad entre los dos conjuntos de búsqueda en las variables de prueba IQ, la edad cronológica de los estudiantes medida en meses, el rendimiento académico de los padres, el rendimiento académico anterior de estudiantes de matemática, fuerza de prueba matemática. El experimento se aplicó en el primer semestre del año académico (2018-2017) y el investigador enseñó a los dos grupos de investigación ellos mismos en cinco clases por semana para cada grupo.
El investigador se preparó en los dos grupos de investigación después de verificar la sinceridad de su contenido, presentándolo a los especialistas y aplicó a una muestra de encuesta para garantizar la claridad de sus párrafos y para asegurar su estabilidad utilizando el método alfa-Kronbach. como sus propiedades psicométricas (fuerza discriminatoria, factor de dificultad, efectividad de alternativas). En cuanto a la medición de la fuerza matemática, el investigador preparó una prueba que consta de (10) párrafos, el investigador confirmó la validez de sus párrafos después de ser presentado a los especialistas y aplicado a la muestra exploratoria para encontrar características psicométricas (factor de discriminación). El investigador también usó varios métodos estadísticos, incluida la prueba T de dos muestras independientes (prueba t) para recompensar a los dos grupos y conocer la importancia de la diferencia entre ellos y la ecuación de Alpha Kronbach para calcular el coeficiente de estabilidad para la prueba de rendimiento y la prueba de fortaleza matemática y el cuadrado de Kay para verificar la equivalencia de los dos grupos de investigación en el rendimiento académico de los padres. 1. Los estudiantes del grupo experimental que estudiaron usando la estrategia Swom superaron a los estudiantes del grupo de control que estudiaron de la manera normal por el logro de logros estadísticamente significativos en el nivel de significancia (0.05). 2. Los estudiantes del grupo experimental que estudiaron usando la estrategia Swom superaron a los estudiantes del grupo de control que estudiaron de la manera normal al probar la fuerza matemática al nivel de 0.05). 3. Existe una diferencia estadísticamente significativa entre los puntajes de los estudiantes del grupo experimental que estudiaron usando la estrategia Swom en la prueba de fuerza pre y post matemática. En este sentido, el

investigador llegó a una serie de recomendaciones y propuestas.

First: Search Problem:
The sense of the research problem stems from the researcher's modest experience in the field of teaching mathematics, where she noticed a marked decrease in the achievement of preparatory stage students in general and fourth grade students in particular, and the reluctance of most students in this stage to learn mathematics and understand it properly, and this may be due to the teaching methods used in teaching The curriculum, which focuses on memorization and conservation and make the learner to receive knowledge and information and not to give any role to participate in the educational process, which will find himself unable to use that information in new situations.
Based on the above, the researcher diagnosed the research problem, which is the need and urgency to develop methods and methods and models used in the teaching of mathematics to improve the level of achievement and mathematical strength, as well as taking into account individual differences between students to keep abreast of developments in the world, including our Arab society in general and Iraq in particular.
So the problem of the current search is determined by the answer to the following question:
Does the SWOM strategy have an impact on academic achievement and mathematical strength among fourth graders in mathematics?
research importance
The SWOM strategy is one of the strategies of teaching supra-cognitive thinking skills, which is based on the integration of thinking in the study content and advocated by many educational institutions in the sense of integrating the mental processes produced clearly when teaching the curriculum, and this strategy came in response to the negative role of the learner The focus of the educational process with increasing motivation towards learning and the ability to organize his knowledge and employ them in the face of reality.It also contributes to the development of supra-cognitive thinking skills because it is characterized by ease, accuracy, clarity and taking into account individual differences in application (Al-Hashimi and Al-Dulaimi, 2008: 141).
The importance of this strategy is that it includes the most important skills of critical thinking and creative thinking and are summarized in six skills: (questioning, comparison, prediction, probability generation, decision-making, problem solving) (Kubaisi and Hasson, 2014: 367).

This strategy also puts the learner in an educational position that needs to be thought of as one of its objectives is to move the learner from the level of quantitative and numerical education to the level of qualitative education that leads him to the mental upbringing and development of thinking, as well as providing the learner with the means and tools that enable him to interact significantly with information (Hashemi and Dulaimi, 2008: 52).
The SWOM strategy emphasizes learners' participation in activity-based learning situations in which content and thinking skills are taught simultaneously.It gives the learner the opportunity to learn and think with his classmate and make learners propose predictions about the information they are reading and give them the opportunity to link ideas in order to stimulate the structure of knowledge. Integration-based thinking is useful in learning thinking skills in order to improve learning and its outputs and to keep abreast of new learning and teaching processes, with the aim of preparing a generation that is inclusive, critical and creative, rather than receiving information and not interacting with it. Hassoun, 2014: 362).
The researcher believes that the importance of the strategy of SOM (SWOM) lies in the association of thinking skills with the mental processes that the learner needs when faced with educational situations and daily life such as problem solving, generation of probabilities and decision-making that help the learner to complete these tasks.
Mathematics has gained an important place in all stages of education and between all courses. Studying mathematics contributes to the development of the mental abilities of learners, and acquire many mathematical skills necessary to study other subjects, in addition to its direct applications in everyday situations which makes an important impact on the individual and society . Therefore, the importance of teaching mathematics in different stages and attention to how to teach and learn the individual and how to master the use of mathematical skills in his daily life (Alkubaisi and Abdullah, 2015 (11 ,.

One of the modern educational concepts in the world of mathematics and evaluated the concept of mathematical power, which represents a criterion for evaluating the achievement of students in mathematics, as it is a modern and non-traditional input in the assessment of the progress of students in the study of mathematics, and this was linked to the standards of international school mathematics of (NCTM), by measuring Their ability to use the language of mathematics to communicate ideas, as well as their ability to analyze and mathematical reasoning, without standing at the level of knowledge mathematical strength as in achievement, and

mathematical strength is also evident in the ability of the student to recognize the linkages between the fields of mathematics and other sciences Between the fields of mathematics and each other so that the student can build a perception of the usefulness of mathematics and how they relate to life problems. Kubaisi and Abdullah, 2015 (76,

Third: Research Objective:

The current research aims to identify the impact of the strategy of SOM (swom) in the achievement of fourth grade students of mathematics and their mathematical strength.

Fourth: Research hypotheses: In the light of the research objective, the following zero hypotheses were formulated:

1- The first zero hypothesis: There is no statistically significant difference at the significance level (0.05) between the average scores of the experimental group students who studied according to the SWOM strategy and the average scores of the control group students who studied according to the usual method of mathematics.

2- Second Zero Hypothesis: There is no statistically significant difference at the level of (0.05) between the average scores of the experimental group students who studied according to the SWOM strategy and the average scores of the control group students who studied according to the normal method in the test of mathematical strength.

Fifth: Limits of research

The current search is determined by:

1- The fourth grade students in the secondary and preparatory day schools of the Directorate General of Education Salah al-Din Department of Education Tikrit.

2- Second, third and fourth semesters of the book of mathematics approved for the fourth grade students by the Ministry of Education for the academic year (2017 - 2018).

Sixth: Definition of terms

The researcher identified the terms in the title of the research:

The SWOM strategy has been defined by:

(Al-Kubaisi and Hassoun, 2014): “An educational strategy that integrates thinking skills in a particular subject, which will hopefully help students improve their critical and creative thinking. It consists of six critical and creative thinking skills: questioning skill and comparative skill (budgeting). Probability, prediction, problem-solving, and decision-making. ”(Kubaisi and Hassoun, 2014: 363).

- (Al-Abdi, 2016): “A set of actions and intentional practices, based on

the inclusion of thinking skills of the strategy during the content of the subject through ideas and educational activities that deepen the thinking of students to achieve the desired educational results for the objectives of the lesson" (Al-Abdi, 2016: 17).

Procedural definition of Swom strategy:

It is a sequential and structured set of teaching procedures and thinking skills used by the researcher in teaching fourth grade students (experimental group) in mathematics with the aim of improving their educational level and increasing its results. Prediction, problem solving skill, decision making skill.

Collection: By:

(Ali, 2011): "The set of facts, concepts, principles, laws, theories and skills acquired by learners as a result of the study of a subject, or a specific unit of study" (Ali, 2011: 299).

(Nofal et al., 2012): "The set of concepts, terms and skills acquired by the learner as a result of his experience" (Nofal et al., 2012: 97).

Procedural definition of collection:

It is the degree that the fourth grade students acquire, or the level they attain during their study of units of study in mathematics, and is measured by the degree obtained by the student after the achievement test prepared by the researcher for the purposes of the current study.

Mathematical strength: defined by:

1- (Kubaisi and Abdullah, 2015): -

Ability to use the mathematical knowledge of its levels (conceptual, procedural and problematic) in the language of mathematical communication, and make the linkages between the branches of mathematics itself and other branches of science on the other hand, and conduct mathematical reasoning to arrive at concepts, generalizations and laws. Kubaisi and Abdullah, 2015 (77,

The researcher defines the mathematical power procedurally:

The ability of fourth grade students to use their mathematical knowledge in the field of mathematics as measured by the scores they will receive in the mathematical strength test.

Theoretical framework

The concept of SWOM strategy continued to be called:

The emergence of the Swom strategy is a response to the urgent need for modern strategies that develop the thinking skills of learners in order to improve their learning and to keep pace with the progress in learning and teaching. Robert Swartz and his colleague Perkins, who is director of the

National Center for Thinking Education in Boston The United States of America This strategy is based on clear and scientific procedures and techniques to achieve many of the objectives that educators at all levels seek to reach. It combines the techniques of teachers that they employ in their classes through questions that deepen the thinking of learners. M thinking to use clear and straightforward in order to produce an effective and integrated formula in designing lessons and teaching strategies (Swartz and Perkins 2003: 25).

The SWOM strategy is an educational strategy that provides a comprehensive organizational plan for the management of the educational process. It provides the learner with instructions, rules and guidelines to ensure a successful learning environment and improve his learning using his interests, talents, thinking patterns and intelligence. Where he is trained on the latest learning theories and methods and strategies of teaching, and that the designation of the name (Swom) came on the basis of the first letter of each word of the name of the strategy in English (School wide optimum) means (the ideal model wide or comprehensive for the teacher S) are comprehensive with all its comprehensive educational institution for all members (Kubaisi Hassoun and 2014: 363).

This strategy has been developed with the Director of Adrak Center for Learning Thinking and Talent Development in the United Arab Emirates (Omar Ahmed) and hence emerged a second direction to the origin of the name of the strategy came from the abbreviation of the names of the two characters Sw (Swartz) and letters (om) of (It provides a comprehensive and sophisticated program that includes all aspects of successful learner preparation and promotes everyone in the school and includes all its elements (Al-Hadidi, 2012: 20).

The Swom strategy is a teaching strategy based on integrating thinking skills with educational content. It combines or combines thinking skills, ie, the integration of productive habits and mental processes and cognitive skills and mental processes clearly and accurately in the teaching of the curriculum in order to improve education and its outputs and to keep abreast of developments in the learning process. The most important characteristic of this strategy is its ease of dealing with it. It is characterized by clarity and accuracy in details and represents a set of ideas and structured questions followed by the teacher when teaching him. Critical and creative thinking skills (Hashemi and al-Dulaimi, 2008: 141).

The researcher believes that Swom strategy is one of the modern strategies that emphasize the participation of learners in educational attitudes based

on activities. It gives them the opportunity to learn, ask questions, think with each other, propose predictions about the information they read and enable them to solve the problems facing them and move the learner from the negative role. Conservation and indoctrination to a positive active active role during the educational process.

Principles of SWOM Strategy:

Some of the most important principles of the SWOM strategy are:

1. Thinking and meditation are the cornerstones of learning.

2 Learning is a lifelong process that is effective and effective in mental processes if appropriate strategies are used.

3 The integration of productive mental habits and cognitive skills and mental processes clearly and specifically in the teaching of teaching materials is the basic structure of the strategy.

4. Attention to emotions, emotions, feelings, attitudes, perceptions and internal beliefs of the learner is half of the learning process.

5 The more the teaching of thinking in a clear and specific way, the greater the impact on learners.

6. Taking into account the individual differences between learners in their thinking patterns, intelligence, abilities, talents, inclinations and different attitudes is an essential element in the success of the educational process.

7- The more the teaching methods within the classroom contain an atmosphere in which the learners indulge in the depths of the mind and thought, learners become more receptive to new and effective thinking (Al-Kubaisi and Hassoun, 2014: 364)

Characteristics of the SWOM Strategy:

Providing a successful and developed learning environment at the same time.

2 improve learning processes and accelerate the learners through raising the level of understanding of learners and understanding of the teaching material.

3 to develop thinking and skills when learners.

4 raise the level of achievement of learners at different levels (superior, medium, weak).

5 help to graduate learners characterized by continuous self-learning also help to develop their talents and interests and attitudes.

6 building meaningful field experiences.

7 learners gain high efficiency of communication.

8 treatment of cases of weakness in a new concept.

9 change the perception of learners towards education from just memori-

zation and indoctrination and study for school tests to enjoy the study and accept the scientific challenges and learning for life.
10. Provide enrichment methods for the educational process. (Albadri, 2013: 26).
The concept of sports power:
The main criterion for measuring the quality of school mathematics is "mathematical strength", which is considered as a modern approach to student assessment. , Or write and interpret mathematical relationships and formulas, and the ability to explain and interpret his findings.

One of the important aspects of the development of mathematical strength is the student's ability to infer mathematical, where the student appears in the ability to display mathematical and life examples of the concept and distinguish it from non-examples, and infer the characteristics of the concept, as well as in the application of some laws on the cases associated and the conclusion of some new laws and related to other cases And discover the fallacies or errors in the conduct of mathematical operations or solutions to some problems, as well as in the assessment and verification of the results and reasonableness (Al-Saeed, Abdul Hamid, 250, 2010).

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The mathematical strength as defined by the National Council of Mathematics Teachers in the United States of America (NCTM) in the fourth criterion of mathematical evaluation is knowledge and post-mathematical knowledge, which includes the student's abilities to reason and think creatively and critically, in addition to the ability to formulate and solve unusual problems. The maximum of mathematical knowledge that can be used by the student to think and communicate mathematically and life, and includes a set of components:
A) The student's ability to use his knowledge to solve problems within mathematics and around different cognitive experiences.
B) The ability of the student to use the language of mathematics to communicate ideas.
C) The student's ability to analyze and reason mathematically.
D) The student's ability to link conceptual and procedural (or operational) knowledge.
E) Recognize the utility of mathematics and the tendency towards it.
F) Understanding the nature of mathematical topics.
G) Recognize the overlap and complementarity of mathematical and other knowledge in a manner that demonstrates the consistency of knowledge. (208 - NCTM, 1989: 205)

The National Council of Teachers of Mathematics (NCTM) in its project standards and principles for school mathematics that the basic criterion for learning mathematics for all students is to possess the skills of mathematical strength, and is intended to the ability of the student to discover, interdependence and logical and mathematical reasoning, in addition to the use of mathematical knowledge and methods effectively to solve unusual mathematical problems . NCTM, 1989: 11))

Dimensions of sports power:

Mathematical power is not limited to mathematical knowledge, but takes into account all the processes that can be developed through learning mathematics.

First Dimension: Content: Includes:

- Numerical and operational sense.
- Measurement and sense of measurement.
- Engineering and spatial sense.
- Relationships and models
- Data and concepts of probability.
- Algebra and algebraic functions.

The second dimension: Mathematical knowledge: It includes three levels of knowledge and experience:

1. Conceptual Knowledge: Knowledge related to the student's ability to perceive concepts and generalizations.
2. Procedural Knowledge: Knowledge of mathematical procedures required of the learner algorithmically, mentally and technologically, and relates to how to learn.
3. Knowledge associated with problem solving: Knowledge that requires linking conceptual and procedural knowledge, and used in solving problems. (Asr, 2, 2006) and (Gad, 148-147, 2009)

The third dimension: Mathematical operations: It consists of three operations:

1. Mathematical communication: the ability of the student to use the language and symbols and the use of different representations and mathematical models in the expression of mathematical ideas or to be able to justify a particular situation or problem in mathematics. (Kubaisi and Abdullah, 2015: 32)
2. Mathematical Interconnection: The standard that conveys mathematics from scattered pieces, to each coherent and tightly consistent and connects mathematics with other subjects and the real world. (Kubaisi and Abdullah, 111, 2015).

3. Mathematical reasoning is the heart of mathematics. (Kubaisi and Abdullah, 78, 2015).

Chapter III

Research Methodology:

The researcher adopted the experimental approach in her research procedures to suit the research objectives and hypotheses.

Second: Experimental Design:

The researcher has adopted the experimental design of equivalence groups with a post-test to suit the current research conditions. The experimental design can be illustrated in Table (1).

Table (1) shows the experimental design adopted in the research

The Group	Pre-test	Independent Variable	Dependent Variable	Post-test
Experimental	Mathematical Power test	SWOM Strategies	1-Achievement 2- Mathematical Power	1-Achievement test 1- Mathematical Power test
Control		Traditional Method		

Third: The research community and its sample:

1- The research community: The current research community consists of the morning and middle schools for boys in the center of Salah al-Din governorate - Tikrit district for the academic year (2018 - 2017), so the researcher visited the Directorate General of Education of Salah al-Din governorate - Tikrit, to determine the location where it is being tried and obtained The names of the schools (8) schools, where the number of students (892) students in the fourth grade of scientific and according to the statistics carried out by the Department of Educational Planning in the Directorate General of Education Salah al-Din

2- Selecting the research sample:

After the researcher identified Khalid Bin Al Waleed preparatory school for the researcher visited the field and found that the school includes three sections for the fourth grade of science (A, B, C) The researcher used a simple random method in the selection of Division (C) to represent the experimental group that will be studied using a strategy The total number of the two divisions reached (67) students and the students who were repetitive were excluded because of their previous experience in the subjects

that will be studied during the duration of the experiment for fear of influencing the dependent variable. Accuracy of the results, after impulse The number of respondents (64) became (32) for the (C) experimental group and (32) for the control group (B). The exclusion was statistically significant when analyzing the results. On the school system,

Fourth: Control Procedures: It is divided into two agencies:

The internal safety of the experimental design:

Before starting the experiment, the researcher on the equivalence of students of the research groups (experimental and control) statistically in some of the variables that are expected to affect the safety of the experiment, and these variables are:

A test of intelligence:

In order to verify the equivalence of the students of the two research groups in the intelligence variable, the researcher relied on the Raven test for successive matrices and using the T-test of two independent independent samples as a statistical means to know the significance of the difference between the two groups. It was revealed that there is no statistically significant difference at the significance level (0.05). (The calculated T value (0.483) is smaller than the T-value of 2.0, with a degree of freedom (62). This indicates the equivalence of the two research groups in this variable and Table (2) illustrates this.

Table (2)

The results of the T-test of the two groups in the IQ test scores

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	30.91	6.87	0.483	2.00
Control	32	31.66	5.47		

B) The chronological age of the students calculated in months:

The researcher calculated the age of the students until 30/10/2017.

Table (3)

The results of the T-test of the two research groups for the chronological age variable calculated in months

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	186.48	6.11	0.30	2.00
Control	32	186.97	6.38		

C previous academic achievement in mathematics:
It is intended for the students of the research sample for the academic year (2015-2016) in mathematics for the sixth grade of primary school. There is no difference between the two groups. This means that the two groups are equal in the academic achievement of mathematics for the previous year, as shown in Table (4).
Table (4)
The results of test (t) for the two research groups of the previous academic achievement variable in mathematics

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	68.81	12.44	0.102	2.00
Control	32	69.13	12.05		

D - Educational attainment of parents:
The results showed that there is no statistically significant difference at the significance level (0.05) which means that the two research groups are equal in this variable as shown in Table (5) and Table (6).
Table (5)
The results of the quai square test (ka ²) to see the significance of the difference between the two research groups in the educational level of the father.

Stages of Education	Groups		Total	Chi-Square Value	
	Experimental	Control		Calculated	Tabulated
Intermediate and less	8	10	18	1.038	5.99
Preparatory	9	11	20		
Diploma and above	15	11	26		
Total	32	32	64		

Table (6)
The results of the Kay square test (Ka^2) to see the significance of the difference between the two research groups in the educational level of the mother.

Stages of Education	Groups		Total	Chi-Square Value	
	Experimental	Control		Calculated	Tabulated
Intermediate and less	18	19		0.328	5.99
Preparatory	9	8			
Diploma and above	5	5			
Total	32	32	64		

E- Sports Strength Test
The researcher developed a test of mathematical strength for parity between the members of her research sample. Statistically significant at the level of significance (0.05) where the calculated T value (0.798) is smaller than the tabular T value of (02.0) degree of freedom (61) This indicates the equivalence of the two research groups in this variable and Table (7) shows this.

Table (7)
The results of the T-test for the two groups in the mathematical strength test

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	27.1034	7.1998	0.798	2.00
Control	32	27.6061	8.08525		

B) External safety of the experimental design:
The following are the procedures for controlling some of these variables:
A- Differences in the selection of sample members: To avoid the effect of this variable in the research results, the researcher conducted statistical parity between the students of the two research groups in five variables that can interfere with the independent variable (strategy swom) impact on the dependent variables (achievement and mathematical strength), as well Random sample selection.
B. Teaching: The researcher has taught experimental and control groups throughout the duration of the experiment to reduce the impact of different

teacher and methods of teaching and dealing with students.
C confidentiality of research: The researcher was keen on the confidentiality of the research in agreement with the school administration not to tell the students the nature of the experiment and its goal so as not to change their activity or deal with the experience, which may affect the integrity of the experiment and the accuracy of the results.
Duration of the experiment: The duration of the experiment was uniform and equal to the students of the experimental and control groups.
E - Study environment and teaching aids: The researcher studied the two research groups in two similar rows in terms of ventilation and lighting and used educational means equally represented by the similarity of blackboards and colored pencils.
Accompanying Accidents: means the natural accidents that may occur during the experiment, which could hinder its progress, such as floods, snowfall, etc. The experiment in this research has not been exposed to any emergency or accident that impedes its progress.
O Experimental extinction (leaving the experiment): No cases of school drop-out or interruption or death of a member of the research sample except cases of absenteeism in slightly and almost equal proportions between the two groups.
Processes related to maturity: These operations did not have the effect that the duration of the experiment, which is almost the first semester is short relative to maturity and uniform for the two groups.
Distribution of shares:
This variable was controlled by the equal distribution of quotas between the experimental and control groups.
Research tools:
The researcher used a standardized and comprehensive measurement tools (achievement test and mathematical strength test), and applied to the two research groups simultaneously, under similar conditions and procedures.
Fifth: Research Requirements: The following steps include:
1 - Determination of scientific material: The researcher identified the scientific material that will be taught to the students of the two research groups, namely, the second, third and fourth semesters of the book of mathematics to be taught for the fourth grade of the academic year (2017 - 2018).
- Behavioral Purposes Formulation: 162 behavioral objectives were formulated in the light of the special objectives of mathematics teaching for the fourth grade and the content of the second, third and fourth semesters to be taught, distributed over the five levels of the Bloom classification

(knowledge, understanding, application, analysis, composition). Behavioral objectives on a group of experts specialized in teaching mathematics and methods, and in measurement and evaluation. After analyzing the opinions of the experts, some of the objectives were amended, bringing the final number of behavioral objectives to 162.

3- Teaching Plans:

The researcher prepared teaching plans to teach the subjects of the experiment to the students of the research groups according to the strategy SOM (Swom) for students of the experimental group and teaching plans according to the usual method for students of the control group, the researcher presented two models of these plans to a group of experts in the field of teaching methods and specialists in mathematics To make use of their opinions, directives and suggestions to improve the drafting of those plans, some amendments have been made to reach their final form and are ready for implementation.

Sixth: Building Research Tools (Tests)

According to the goal of the present research requires the preparation of two tools to measure the two variables, namely the achievement test and the test of mathematical strength.

The following are the detailed procedures followed by the researcher in preparing the two tools:

First: Achievement Test: The construction of the test included the following steps:

1- Preparation of specifications table (test map)

The number of test items was set at (40) thematic items distributed to the test map cells. Table (8) illustrates this.

Table 8

Test Map

No.	%	Levels					Sum
		knowledge	comprehension	Application	Analyses	syntheses	
2	39%	5	4	5	1	1	16
3	19%	3	2	2	0	0	7
4	42%	6	4	5	1	1	17
	100%	14	10	12	3	3	40

- Formulation of the test paragraphs: The researcher considered that the test should be considered as an objective type of tests because of this type of positives. Therefore, 40 thematic paragraphs of the type of multiple choice were prepared.
3 - Validity of the test: The test paragraphs were presented to a number of arbitrators and specialists in mathematics and methods of teaching, and in the measurement and evaluation to determine their views on the comprehensiveness of the content and clarity of paragraphs and the extent of measurement of the behavioral objectives set for it, and the distribution of grades on the paragraphs and the logic of alternatives and the attractiveness of some of the amendments. The paragraphs that received an agreement rate (80%) of the percentage of experts.
4 - Formulation of test instructions: developed instructions to answer the paragraphs of the test and included how to answer the paragraphs that need to, and the answer time and distribution of scores on the paragraphs.
- Test correction method: One grade is assigned to each of the items of multiple choice and the correct (0) for the wrong or abandoned answer of (40) items, and thus the total score of the test (40).
5- Clarity of Instructions and Test Clauses: For the purpose of verifying the clarity of the test clauses and instructions and calculating the time required to fully answer the test clauses, the test was applied to a survey sample, which was randomly selected from Tikrit Education Department High School, Omar Bin Jandab High School (25) students. From the fourth grade students, the average test time was set at (38.32) minutes, verified the clarity of the instructions and test items, and how to answer.
6 - Statistical analysis of the achievement test items: The achievement test was applied to a sample of (100) fourth grade students from (3) secondary schools. The answer papers were corrected, the final scores were sorted in descending order, then the highest percentage (27%) of the students 'scores were taken to represent the higher group, and the lowest (27%) of the students' scores to represent the lower group. The data were analyzed statistically as follows:
- Difficulty coefficient of the paragraphs: calculate the difficulty coefficient for each of the substantive test paragraphs, the results ranged between (0.277 - 0.629), and studies in the field of measurement and evaluation indicate that the paragraphs that have difficulty between (0.20-0.80) is acceptable.
- Coefficient of discrimination of the paragraphs: When calculating the discriminatory power of each of the substantive test paragraphs, it turned

out to be between (0.740 - 0.296), so all test paragraphs are of good distinction strength, as the test paragraph, which has a discriminatory capacity (0.20) and above is a good paragraph. Thus, all test items are acceptable.
- Effectiveness of the wrong alternatives: When calculating the effectiveness of the wrong alternatives for each paragraph of the multiple choice, it was found that the coefficients of the effectiveness of all alternatives are negative, and thus decide to keep them all.
- Stability of the test: The stability of the achievement test has been calculated by the Fakronbach equation (0.954). This equation is characterized by its accuracy. The calculated stability factor indicates the consistency of the individual's performance from one paragraph to another. The achievement test thus became final.

Sports strength test:

The goal of preparing the test is to measure the mathematical strength of the fourth grade students, after reviewing the researcher on the previous literature and studies related to mathematical strength, and the lack of a ready test for the research community (fourth grade), and the subject of (mathematics), based on the theoretical background of this topic. Consultation of specialists in the field of teaching methods, the researcher built and prepared a sports strength test following the following steps:

A- Determining the concept of sports power

The theoretical concept of mathematical power has been defined in the background of the theoretical research presented in the second semester. To effectively solve unusual mathematical problems "

B. Preparation of the test paragraphs in their initial form:

The researcher reviewed a number of studies, including the study (Obeida, 2007) and the study (Sorour, 2010) and study (Sidawi, 2012), has been identified areas of sports strength and skills used and determine the skills measured by the test are (sports communication, mathematical coherence and mathematical reasoning In addition to their sub-components, which were addressed in the theoretical framework.

I have noticed that mathematical strength tests revolve around the laws and skills students have learned during their studies and the possibility of using them in later stages and situations.

The researcher followed the same approach and commensurate with the possibilities of fourth grade preparatory scientific students and their ability to infer and communicate and mathematical cohesion through understanding and attention to the details of situations, and the initial test consisted of (10) paragraphs graded in difficulty and require solutions and vision for

situations or puzzles. Drafting test paragraphs after defining the fields as follows:

- Drafting test paragraphs in clear and understandable language for all students.
- Each test paragraph expresses a problem that includes the necessary information that enables students to respond to the test paragraphs successfully.
- Writing the test paragraphs in the manner that the student entrusted with the tests that passed him in previous years does not face difficulty or amazement in solving them

a. Answer instructions and debug key:

The researcher prepared the test instructions in order to complete the initial and final version of the test taking into account the clarity of the paragraphs, noting that the results obtained for the test are for other purposes, and asked the respondents not to leave any paragraph unanswered.

The researcher also developed a typical answer for all the paragraphs that I used to correct the test and the total score of the test is (60).

D) Validity of the test: It is intended to measure the test what has been developed to measure it, as it gives a complete and clear picture of the ability of the learner on the characteristic to be measured (Absi, 2010: 210) In order to verify the validity of the test, the researcher verified the following types of honesty:

• Virtual honesty: To achieve this, the researcher presented the test clauses as preliminary to a group of arbitrators and specialists in the field of education and teaching methods to judge the validity of the clauses in the measurement of mathematical strength and represent the skills of the subject of research and suitability for the age (research sample) and the proportion of agreement was calculated (85%) and above.

E. The first exploratory application of the test of sports strength:

The researcher applied the test consisting of (10) paragraphs on the first survey sample (30) students in different schools to calculate the time required to answer the test paragraphs, clarity, and special instructions to answer them, and shows the clarity of the test paragraphs this because students do not inquire about its paragraphs and instructions except some Typical questions from students As in all tests, the average answer to the completion of the first five students and the last five students of the answer (40 minutes).

The second exploratory application of the test of sports strength:

The researcher applied the test to a second exploratory sample of (100)

fourth grade preparatory students in several secondary schools to analyze the test items and extract psychometric properties.

K - Statistical analysis of the test paragraphs (psychometric characteristics):

After completing the correction of the answers of the second survey group by one score for the correct answer and zero for the wrong, abandoned or indicative answer with more than one choice, the students' scores were sorted in descending order and set (27) the highest score for the upper group and (27) for the lower group by (27%) of the total students. For the purpose of calculating the discrimination factor and the stability of the test.

• Discrimination coefficient: The discriminatory strength of the mathematical strength test items was found according to their equation. It was found that the values of the coefficient of discrimination ranged from (0.70 to 0.63), and the test paragraphs were considered acceptable.

• Stability coefficient of test: Stability coefficient was calculated using the internal homogeneity method by adopting (Alpha-Kronbach equation) and using the statistical analysis bag (spss).

The final version of the sports strength test:

After verifying the validity and stability of the test and finding the discriminatory power of its paragraphs, the test is ready to be applied to the basic study sample and its final form consisting of (10) paragraphs, and a time of (45) minutes.

Seventh: Application Procedures:

1- Implementation of the experiment: The researcher applied the experiment to the students of the two research groups teaching five lessons per week for each of the research groups, and lasted nine weeks.

Eighth: Statistical Methods:

T - test for two independent samples, coefficient of difficulty, coefficient of Kronbach alpha, square Kai, the effectiveness of false alternatives.

the fourth chapter

First: Presentation of Results:

1. Results related to the first hypothesis:

To validate the hypothesis, the researcher used the T test of two independent independent samples to analyze the data statistically. The calculated T value was (2.86) at the level of (0.05) degree of freedom (62), which is greater than the tabular T value of (2.00). This means that the difference is statistically significant, which indicates the superiority of the experimental group students who studied according to the strategy (swom)) than the students of the control group who studied in the usual way in the achievement

test, thus rejecting the null hypothesis and accept the alternative hypothesis:

Table (9)

Arithmetic mean, standard deviation, calculated and tabulated T value and statistical s

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	22.28	3.86	2.86	2.00
Control	32	19.50	4.12		

ignificance of the collection test

Results related to the second zero hypothesis:

When using the T test, the calculated value was (3.26), which is greater than the tabular value (2.00) at the level of significance (0.05) and the degree of freedom (61).) Illustrates it.

Table 10

Arithmetic mean, standard deviation, T and tab value of the scores of students of both research groups in the mathematical strength test

Groups	No. of STs	Mean	Standard Deviation	t Value	
				Calculated	Tabulated
Experimental	32	22.28	3.86	2.86	2.00
Control	32	19.50	4.12		

3. Results related to the third zero hypothesis:

For the purpose of validating the null hypothesis, the T-test of two correlated samples was used to analyze the results to find the difference between the pre- and post-scales. The calculated T value was (4.15) which is greater than the tabular T value of (2.00) at (0.05) and the degree of freedom (31). This means that there is a statistically significant difference between the average and for the scale and the table (11).

Table (11) Arithmetic mean, standard deviation, T and tab value of the experimental group student's scores in pre and post mathematical strength test

Groups	Mean	Standard Deviation	Mean of diff.	Standard Deviation of diff.	t Value	
					Calculated	Tabulated
Post- test	27.10	7.19	4.41	5.73	4.15	2.00
Pre-test	31.52	4.93				

Third: Interpreting and Discussing the Results:

1. Interpretation of the results related to the collection:

The results presented in the table (the results of the collection) showed the superiority of the experimental group students who studied according to the SWOM strategy over the control group students who studied in the normal way in the average of the achievement test scores due to the following reasons:

A. The SWOM strategy has helped to link the previous mathematical information that the student has to the new mathematical information and build it in an integrated manner. This is consistent with the study of sports as a cumulative knowledge. Her and keep them longer and make it easier for them to remember and retrieve them again, which increased their academic achievement.

By using the SWOM strategy and its six skills of questioning, comparing, predicting, probability generation, problem solving, and decision-making, this strategy has helped to present the content of the course in a new and fun way so that it has been generally applauded by students and generates good abilities and motivation for learning. Teaching according to this strategy requires active and active participation of students when presenting skills on a regular and coherent basis and employing their abilities and mental processes during the lesson.This has helped to make some of them active participants throughout the lesson, which enhanced the students' self-confidence. Students in the control group.

2. Interpretation of the results related to sports power:

This is due to the following reasons:

B that this strategy because of the skills included in the students made a positive tendency to learn mathematics, which reflected in their hopes to solve mathematical problems.

C. This strategy worked to stimulate thinking among students and motivate them through the skills of (Probability generation and prediction), which serve as the beginning of my skills (problem solving, decision-making).

The SWOM strategy has helped to acquire new and varied study skills such as investigating, researching, organizing and processing information. It has also helped the student to be more organized in his learning and analysis of information in order to solve the situations and problems facing him, leading to the development of mathematical strength among the experimental group students.

Fourth: Conclusions

In the light of the results of the current study, the researcher reached the following:

1. Teaching the curriculum of mathematics according to the strategy of SOM (swom) in terms of interrelated and sequential steps contributed to increasing the achievement of experimental group students in mathematics compared to the achievement of control group students studied in the usual way.

2 - Adoption of the strategy SOM (swom) as a modern strategy that helped to develop the mathematical strength of fourth grade students by learning the skills of this type of mental processes.

3. The SWOM strategy has had a clear impact on increasing the achievement of students of the experimental group and acquiring and developing the skills of mathematical power, unlike the usual method.

Fifth: Recommendations

In the light of the current research findings and conclusions, the researcher presents a set of recommendations as follows:

2 - Adopting the strategy of SOM (swom) in the teaching of mathematics for the fourth grade of scientific clear effectiveness and direct impact in increasing academic achievement and mathematical strength.

3- Training and developing the skills of teachers of mathematics in particular and other sciences in particular on how to use modern educational strategies, especially the strategy of SOM (swom) through the establishment of courses and educational seminars.

Sixth: Proposals

To complement the present study, the researcher proposes to benefit from the SWOM strategy in conducting the following scientific studies and research:

2- Conducting studies and research to identify the strategy of SOM in other variables such as gender, inclinations, motivation and other types of thinking and in other stages of study in several governorates.

3. I propose the application of the strategy SOM (swom) on science other than mathematics.

4- Knowing the effect of using the SWOM strategy in teaching and comparing it with other strategies such as the ability to solve problems, for example.

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The impact of the Swom strategy in the achievement of students in the fourth grade scientific and development of their athletic strength

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Research Summary
The objective of the current research is to identify the impact of the Swom strategy on the achievement of the fourth grade students and the development of mathematical force on them.
In the light of the objective of the research, the researcher formulated zero hypotheses, and to verify the purpose of the research and hypotheses, the researcher Khalid Bin Al-Walid junior high school for girls belonging to the Department of Education Salah al-Din chose the Department of Education Tikrit intentionally to place a trial in it, and randomly selected divisions (B, C) (B) represents the control group to be studied according to the normal method. After excluding a number of students who were statistically absent, the number of students in the research sample (64) A student includes the group Experimental (32) students and the control group comprising (32) were verified parity between the two sets of search in the IQ test variables, the chronological age of the students measured in months, academic achievement for parents, former academic achievement of students in mathematics, mathematical test force.
The experiment was applied in the first semester of the academic year (2018-2017). The researcher taught the two research groups themselves five sessions per week for each group.
The researcher prepared the two sets of research after verifying the validity of its content by presenting it to the specialists. It was also applied to an exploratory sample to ascertain the clarity of its vertebrae

and to ensure its stability by using the Alpha Kronbach method, and its cykometric properties.

As for the measurement of sports force, the researcher prepared a test consisting of (10) vertebrates. The researcher confirmed the veracity of his vertebrae after his presentation to the specialists and applied it to a survey sample to find the cykometric characteristics.

The researcher also used a number of statistical methods, including the test of two independent test-t for the two groups and the difference between them and the α-cronbach equation to calculate the stability coefficient for the achievement test and the sports force test and the Kay equation to verify the equivalence of the two groups in the educational achievement of the parents.

1. The students of the experimental group who studied using the Swom strategy exceeded the students of the control group who studied in the normal way the D test by statistically significant (0.05).

2. The students of the experimental group who studied using the Swom strategy exceeded the students of the control group who studied the normal method by testing the mathematical strength at the level of significance (0.05).

3. There is a statistically significant difference between the scores of the experimental group who studied using the Swom strategy on the test of tribal and post-tribal sports force.

In light of this, the researcher reached a number of recommendations and suggestions.

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