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Effectiveness of Teaching by SWOM Strategy in Achievement and Retention of Second Intermediate-Grade Students in Science

Abstract

This research-aims to investigate (the effectiveness of teaching SWOM strategy in achievement and second-graders intermediate students retention in the sciences subject) The experimental design (with-partial-control) was chosen for two equivalent groups, experimental and control, the sample was randomly selected-from-students (Hittin intermediate school) for girls in Thi-Qar Governorate), the groups were equivalent in-variables (Age calculated in months – female students' achievement in-science for the first-grade (previous-year) –previous information testin science-subject – intelligence test (Raven), behavioral objectives in cognitive domain were set reached (100) behavioral objectives, the necessary teaching plans were prepared for two research. The research tools, the researcher prepared a test comprises (40) MC items with four alternatives. Validity, reliability, discrimination-coefficient, difficulty-and-alternatives effectiveness were calculated. At the end of second semester (2018-2019),the experiment was applied. After the experiment was completed, the achievement test was applied on two research groups. Then, the same achievement test was applied again after a two weeks period-from first application to check information retention, and for processing statistical data, the statistical methods were used (t-test for two independent samples, difficulty-equations, items-discrimination, wrong alternatives-effectiveness and Pearson-correlation-equation), the-research was reached the results: There is a statistical significant difference at the significance level (0.05) between second grade students means scores who study science subject according-to the SWOM strategy and the second-grade students mean-scores who study the-same subject by traditional method in achievement and retention test in favor of the experimental group, depend on the results, several conclusions were formulated, conclusions and recommendations-were reached, to complete th- research, several studies-were proposed.

Keywords: Achievement, SWOM Strategy, Retention, Teaching.

Introduction to Research

First / The Research Problem

Although the results of educational studies and research added new dimensions to the results of learning in the educational field and to

find solutions to educational problems, there is a clear weakness in the levels of students in discovering and applying knowledge in their daily lives, and the situation indicates that the teacher is still captive to the traditional method of teaching which It works to provide students with

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the most amount of information without taking into account the scientific benefit from it, because the information gained in this way does not constitute any importance for them in their lives, and does not solve their problems for them, and their relationship ends with them after they perform their job, which is the answer to the exam questions, and it is also estimated that achievement Students insist that they keep scientific facts and information without using them to have any impact on their lives, and therefore the learner will find himself unable to use that information to manage the affairs of his daily life or adopt it in new situations that require him to practice thinking processes and skills.

Accordingly, it is necessary to search for teaching methods that help the student rely on himself in the learning process and under the supervision of the teacher, and since the science subject is a branch of the natural sciences, therefore appropriate modern methods and strategies must be used in his teaching in order to lead to raising the scientific level of students especially in the stage Intermediate school and this is what led the researcher to feel the problem, which led her to see some studies in this field such as (Hussein, 2012), (Abdul Amir, 2016) that indicated a decrease in the achievement of female students, and all of them stressed the need to use modern teaching methods Consistent with the development taking place in educational methods and educational techniques, all of this has led to a feeling and a sense of the research problem, which can be formulated as follows:

(What is the effectiveness of teaching with SWOM strategy in achievement and retention intermediate second students in the science subject?)

Second / Importance of Research

The characteristics of our present age is the rapid growth of information, due to the wide spread of technologies as well as the multiplicity of means of information transfer and as a result of this great development and complexity in society and the environment, it has become necessary to obtain the basics of science and the types of skills and knowledge in dealing and investing in the scientific method and its acquisition, especially that humanity lives the era of global thinking, global knowledge and knowledge, global crisis, accomplishments, rights and duties, universality of ambitions and human values, and this requires awareness of generations and to learn how to think and work, which confirms their need for science so that the individual can bear responsibility towards the problems and variables and crises he faces in

order to adapt and continue in this life (Abu Al-Wafa and Salamah, 2008: 17).

Scientific education is one of the important aspects in this era, which was characterized by the enormous scientific and technological changes in all areas of life, and because scientific education is one of the important means in accommodating the rapid developments that the world is going through today, and this is why the school must go with scientific education and prepare the individual to face everything new with guidance and guidance. (Nashwan, 1989: 352).

Therefore, interest has increased day after day to improve and develop methods of teaching science, by using teaching strategies that raise the learner's desire to love polling, as well as contribute to the development of self-learning and make progress in understanding scientific concepts, and its ability to solve problems (Salama et al., 2009: 17).

Upon, the importance of the current research concluded in the following:

1. This research is the first study dealing with the strategy SWOM with the variables of achievement and retention (according to the researcher's knowledge).
2. SWOM strategy is one of the strategies developed that helps students to learn, increase their motivation, focuses on thinking skills in learning and includes these skills in the academic content, as well as makes the student the focus of the educational process, which has an effective role inside and outside the class, and facing it To solve the problems you face.
3. This research is responsive to conferences and seminars that recommend the necessity of conducting field and applied research to develop science education.

Third / The Research Aims

The current research aims to identify:

1. The effectiveness of SWOM strategy on achievement among intermediate second students in the science subject.
2. The effectiveness of SWOM strategy on retention of intermediate second students in the science subject.

Fourth/ Research Hypotheses

For verifying the two research aims, the following two hypotheses have been formulated.

1. There is no statistical significant difference at the level of significance (0.05) between the scores mean of the intermediate

second students who study science subject according to the strategy SWOM and the scores mean of the intermediate second students who are studying the same subject according to (the traditional method) in achievement.

2. There is no statistical significant difference at the level of significance (0.05) between the scores mean of the intermediate second grade students who study science subject according to the strategy SWOM and the scores mean of the intermediate second grade students who study the same subject according to the (traditional method) in retention.

Fifth / Research Limits

The current search is limited to:

1. **Human limit:** a sample of intermediate second students in ThiQar Governorate / Nasiriyah for the academic year (2018-2019).

2. **Time limit:** the first semester (2018-2019)

3. **Place limit:** The intermediate, secondary, day and government schools for girls in the center of ThiQar Governorate / Nasiriyah (Hittin Intermediate) for the academic year (2018-2019).

4. **Cognitive limit:** (the first unit) elements and compounds, the second unit (formulas of chemical reactions), from the textbook of science scheduled for teaching for the second intermediate grade by the Iraqi Ministry of Education 4th edition, for the academic year (2018 - 2019).

Sixth: Defining the Terms

First: Effectiveness: Shehata and Al-Najjar (2003) defined it as:

The level of the effect that experimental treatment can have as an independent variable in the dependent variables (Shehata and Al-Najjar, 2003: 23).

The researcher procedurally defines it as:

• The amount expected to be obtained when using SWOM strategy in the achievement and retention of the average second-graders for the two research groups (experimental and control), and this is determined statistical.

Second: SWOM strategy, Raji (2016) defined it as:

• A set of systematic steps, activities, learning, and interrelated and planned educational activities that are based on thinking skills, namely questioning, comparison, generating possibilities, forecasting, problem solving, and decision making (Raji, 2016: 154).

The researcher procedurally defines it as:

• A set of sequential and interrelated procedures that rely on integrating thinking skills

(namely, questioning, comparison, probability generation, prediction, problem solving, and decision making) with educational content through which science is taught to second intermediate students (experimental group).

Third/ Academic Achievement: It was defined by:

• (Abu Jado, 2009): As the outcome of what the learner learns after a period of time can be measured to the degree that he gets in an achievement test in order to know the success of the strategy that the teacher sets and plans to achieve his goals and what the student gets from the knowledge translated into degrees (Abu Jado, 2009: 469).

The researcher procedurally defines it as:

The degree that the student obtains when she responds to the final test prepared by the researcher for the purposes of the current research.

Fourth: Retention: It was defined by :

• (Al-Kubaisi and Al-Dahri, 2000): As storing impressions in memory by forming connections between them and forming units of meanings (Al-Kubaisi and Al-Dahri, 2000: 89).

The researcher procedurally defines it as:

The amount of what the students of the research sample (the second average female students) retain for two groups (experimental and controlling) in the science subject during the experiment period as measured by the degrees obtained from re-applying the test after (14 days).

Theoretical Background

First: SWOM strategy (School Wide Optimum Model)

SWOM strategy is one of the strategies of meta cognition, this strategy works to integrate thinking skills, that is, to integrate productive mental habits and processes, educational skills and skills into the curriculum with different educational stages, where it works to make the student the center of the educational process and its basis, which is based on higher thinking skills and thus The student got rid of the negative role of the recipient and made it effective and participant in the educational process, and the name of this strategy SWOM came to shorten the first letter of each word in the English language, which is known as School Wide Optimum Model, i.e. the ideal or broad ideal model for each school, as it is considered one of the modern trends In teaching super-cognitive skills, and its goal is to improve learning and its production, to prepare a conscious generation thinking towards a critical and creative, and

holistic way (Routmun 2012) referred to in (Selim, 2016: 149).

The SWOM strategy is based on six main skills:

1. Questioning skill: It is one of the skills that the student is intended to develop and benefit from its impact on the educational process and learning outcomes because the question has a role in distorting minds, arousing thinking, attracting attention and stimulating learning by involving the student in the learning process (Attia, 2016: 333).

2. Comparative skill: It is one of the basic thinking skills and aims to organize information and develop knowledge. The comparison process requires identifying the aspect of agreement and difference between two or more things and examining relations between them, searching for points of difference and similarities and knowing what is between them, and is missing in the other (Shawa'in), 2009: 13).

3. Prospecting skill: The procedures for this step relate to the skill of generating probabilities and developing them among students, in which students are asked to employ the questions and analyzes that were made to generate the prospects or the consequences of events or ideas that are included in the clarity or interpretation of the results or their explanation and linked to their causes (Attia, 2016: 334).

4. Prediction skill: It means the skill used by someone who thinks about what will happen in the future, and for students it represents thinking about what will happen in the future (Saada, 2011: 561).

5. Problem-solving skill: The procedures for this step are related to naming the ability to solve problems among students, so it begins with the elaboration of specific problems that can be felt in the new topic and what is related to it and its status. As for students and asking them to search for solutions and formulate these solutions in ways that are applicable and practice the matter that contributes By providing students with the means they employ to address situations they may be exposed to, both in the classroom and in public life (Attia, 2016: 235).

6. Decision-making skill: It is a thinking process that aims to select the best possible alternatives or solutions for the student in a specific situation in order to reach the goal that he seeks (Abu Asaad, 2009: 152).

Strategic skills SWOM can be represented as shown in chart (1):



Importance of SWOM Strategy

The importance of SWOM strategy is that it: It helps female students to learn as it increases their motivation and is based on thinking skills in learning, and the integration of these skills in the academic content as it came in response to the negative role of students and made them the focus of the educational process, where this strategy helps students to organize their ideas It increases their attention to the lesson, and hence increases their ability to manage their knowledge and employ it in an effective way in facing reality, including what it contains and includes the lesson, comparison, and generation of possibilities, problem solving, prediction, and decision-making, and thus helps to develop students' knowledge above (running And Ibrahim, 2003: 286-285).

Second / Academic Achievement

Achievement in its modern concept is the acquisition of scientific knowledge and the correct methods by which it is possible to reach academic skills in an organized scientific way, so it is concerned with two basic aspects of the learning outcomes are the (cognitive) side and the (skill) side, and that the interest in the cognitive side and the skill side means interest implicitly in the emotional side (The Beautiful, 2000: 113).

Third / Retention

It is information retention, which includes cognitive strategies and processes that aim to keep the information that is acquired and learned in the memory repository for a long or short period (Katame and Naifeh, 1998: 107). This depends on factors represented in the time and effort that students make during the process of coding and processing information, and the

extent of The presence of stimuli or previous information related to it and the nature and quality of information (Zaghloul and Hindawi, 2004: 253).

Research Methodology and Procedures

First / Research Method and Experimental Design

Given the nature of our research that examines (the effectiveness of teaching by a strategy of SWOM in the achievement and retention of intermediate second students in the subject of sciences), the appropriate for this research is the experimental approach which is the way through which the researcher determines the various conditions and variables that appear in Investigating information about a phenomenon, as well as controlling and

controlling such conditions and variables (Al-Juburi, 2013: 195).

The choice of experimental design is the first step that the researcher should take when conducting her practical experience, as the safety and validity of the design are the basic guarantee to reach accurate results, and appropriate answers to her research questions and test her hypotheses (Al-Jabri and David, 2015: 103).

Since the research includes one independent variable and two dependent variables, the researcher adopted the experimental design with two equivalent groups (an experimental group and a partial control group) with a dimensional test of achievement and retention, and scheme (2) illustrates this. Research.

Group	Equivalence	Independent Variable	Dependent Variable
Experimental	-Ages of students by months	SWOM Strategy	Achievement Retention
Control	-Intelligence test of Raven -Scores of Sciences of past year -Past information	Usual Method	

Scheme (2): Experimental research design

Second / Research Community and Sample

1. Research community

The current research community includes all intermediate second-grade students in the official government day and middle schools for girls within the boundaries of ThiQar / Nasiriyah Governorate Center for the academic year 2018-2019.

2. The research sample

This school was chosen for the purpose of applying the research experience and intentionally medium to Hittin for girls and randomly chose class (A) to represent the experimental group whose number of students reached (31), and class (C) to represent the control group whose number of students reached (32) Thus, the total number of the research sample (63) is primarily female, and after the female students who were statistical excluded from the two groups were (3) students, (1) of them were in the experimental group and (2) in the control group, while ensuring that they remained in their classes in order to preserve a system School and their continuing education, and the reason for excluding them is due to the duration of the experiment, which may have an impact on the dependent variable. Thus, the final number of the research sample has become (60) by (30) students for the experimental group and

(30) students for the control group, as in Table (1).

Table 1.
The research sample

Classes	Group	Before excluding	Number of excluded Students	Remaining
A	Experimental	31	1	30
C	Control	32	2	30
Total		63	3	60

Equivalence of the two research groups:

Before the researcher started applying the experiment, I made sure that the two research groups are statistical equal in some variables that may affect the integrity of the experiment and the accuracy of its results in the results of the experiment and a table (2) illustrates these variables.

Table 2.
Statistical significance of valence variables between the two groups

Variable	Group	N	Mean	Variation	df	t-test	t-testable	Significance at (0.05)
Age by months	Experimental	30	13.79	51.72	58	0.62	2	Non-Significant
	Control	30	13.67	42.18				
Intelligence (Raven)	Experimental	30	46.35	46.35	58	1.59	2	Non-Significant
	Control	30	43.35	46.35				
Past Achievement	Experimental	30	26.44	59.67	58	0.26	2	Non-Significant
	Control	30	25.94	42.81				
Past information	Experimental	30	14.08	7.38	58	1.38	2	Non-Significant
	Control	30	13.11	7.10				

Fourth / Non-Experimental Variables

Intended and exotic variables: they are the variables that can affect the dependent variable and the researcher cannot stop its effect, and this variable does not enter the research design and is not under the control of the researcher, but it affects the results of the research or the dependent variable an undesirable effect, and the researcher cannot notice the variable The intruder or its measurement, but it assumes that there are a number of exotic variables and takes them into consideration when discussing and interpreting the results and can get rid of their impact by controlling or identifying them (Al-Juburi, 2013: 199), and among these variables that the researcher believes may affect the accuracy of the search results are (Duration, maturity, class distribution, teaching aids).

Fifth / Research Requirements

The current research requirements include the following:

1. Determination of the scientific subject: The researcher determined the scientific subject

that she is teaching to students of the two research groups during the duration of the experiment for the first semester (first semester) of the academic year (2018-2019), including: unit one: (elements and compounds), Chapter Two: Unit Two: (Formulas, Chemical Interactions and Solutions), from the textbook of science subject to be taught for the second intermediate grade.

2. Determining behavioral objectives: Behavioral goals mean the phrases (positive changes) that the teacher and students seek to achieve when teaching a particular lesson, and its positive impact appears on student behavior (Al-Zameli et al., 2009: 299). The behavioral objectives have been presented to a group of experts and arbitrators in the field Education and methods of teaching science and psychology, to show their views on their safety and suitability for their cognitive levels, and their coverage of the content of the study material, and the researcher made some adjustments, as the number of objectives reached (100) behavioral objectives, and the goals were considered valid if they obtained an agreement rate (80%) of the opinions of arbitrators and specialists.

Table 3.
Distribution of behavioral goals

	Level / Content	Remembering	Understanding	Applying	Analyzing	Total
1	Unit One	25	15	10	9	59
2	Unit Two	15	10	10	6	41
	Total	40	25	20	15	100

Preparing teaching plans: It is a set of written organizational procedures and measures that the teacher takes (Zaitoun, 2001: 264), and the researcher believes that preparing educational plans is one of the requirements for successful teaching, so the researcher prepared teaching plans for the topics that he studied during the trial period, which is (the first and second unit) From the book of sciences scheduled for the second intermediate grade for the academic year (2018-2019) and they numbered (22) plans. The students of the experimental group and the students of the control group were taught by them.

Sixth: The Research Tool /

• **Achievement Test:** The Achievement Test is an important part of the educational

process that the whole process is organized and planned in advance and proceeds according to specific goals and that the test conducted by the teacher aims to know what has been achieved from the educational goals and the test must be planned and prepared in advance (Al-Ajili et. al., 2001: 18).

• **Formulation of test items:** Formulation of test items is one of the basics of building the achievement test. After the teacher finishes preparing the schedule of specifications, he must choose the questions included in the test and must be formulated in easy and clear terms and indicate the intent of the question directly without the need to inquire about it (Al-Taiti, 2008: 248), the researcher defined the achievement test clauses in this research as (30) from the multiple choice type and with four alternatives. This type of test was chosen because it is one of the best types of tests and the most reliable, stable and used, as well as covering the content of the book School and easy to correct.

• **Specifications Table:** It is a detailed chart that includes the main headings of the content of the subject, its concentration, and the number of questions assigned to each part of it (Al-Dhahiret. al. 2002: 80).

Table 4.

Test plan for the behavioral goals of the achievement test

Content	Number of lessons	Content Percentage	Remembering %41	Understanding %30	Applying 16 %	Analyzing 13 %	Total 10 %
Unit One	6	%40	5	5	3	2	15
Unit Two	9	%60	7	4	2	2	15
Total	15	100 %	12	9	5	4	30

• **Validity of the test:** It means that the test measures the purpose for which it was prepared (Odeh& McCaw, 1992: 193), and for the sake of the truth of the test, the researcher used the following:

A-Face Validity: It is the general appearance of the test or its external image in terms of the type of vocabulary, how to formulate it, and the clarity of its items (Al-Gharib, 1980: 68). To achieve this purpose, the researcher presented the test items to a group of experts,

arbitrators, and specialists in measurement, evaluation, and teaching methods Sciences, to express their opinions and observations on the validity of the items.

B-Content Validity: The achievement tests are considered if they indicate an acceptable degree to the representation of the test for the content of the study subject or the extent of the item's relevance to the target content it measures (Ibrahim et. al., 1989: 73)

• **Exploratory Applying test**

• **The application of the achievement exploratory test**

To ensure clarity of the items and test instructions, and to determine the test time, the test was applied to an exploratory sample consisting of (30) female students from the second intermediate class in the (Great Messenger School for Girls) and after agreeing with the school administration and the school of material to take the test and after the students have finished studying the first semesters From the book of science.

• **Statistical analysis of test items:**

coefficient of item difficulty, discrimination of item, effectiveness of faulty alternatives, Kuder-Richardson – 20 equation, effect size equation (Klass equation).

C- Reliability of the test: Reliability in the concept means reliability and accuracy in measurement, i.e. access to the same information in the case of repeated testing a number of times, and the learners themselves (Kuder-Richardson 20) because it is a measure of internal compatibility or consistency of the test material (George, 1991: 350), The correlation coefficient is (0.84), and this indicates that the test has a high level of reliability.

Seventh: Procedures for applying the experiment

A- Applying the Test on the Research Sample

The experiment started on Sunday 20/Oct/2018 with two lessons per week and ended on Thursday 19/Dec /2018. The achievement test was applied on the two research groups on Monday 23/Dec/2018.

B- Apply the Test to Measure Retention

Test applied again on Monday, 6/Jan/2019, after two weeks the test applied on the same research sample, to know the level of their retention of the studied scientific subject.

Eighth: Statistical Methods

The researcher used the following statistical methods:-

1. t-test for two independent samples equal in number (Al-Kubaisi, 113: 2010).
2. The difficulty factor equation (Al-Nabhan, 2004: 199).
3. Item discrimination equation (Al Nabhan, 2004: 199).
4. Equation of efficacy of wrong alternatives (Al-Nabhan, 2004: 199)
5. K-R 20 Equation (Al-Absi, 2010: 213).

Presentation and Interpretation of Results

First: Show Results

A- Verify the First Null Hypothesis, Which States that

There is no statistical significant difference at the level (0.05) between the scores mean differences in achievement for students of the experimental group that are studying science using SWOM strategy and the scores mean difference in achievement for the control group students who study the same subject in the usual way.

To verify the validity of first null hypothesis, scores means differences in achievement were calculated for students of the two research groups in the post achievement test, and the results revealed that scores means difference differences in achievement for students of the experimental group (66.97) and variance (156.54), while the control group scores (53. 35) and Variation (153.59), as in table (5).

Table 5.

Mean, variance, and calculated and tabulated t value of the two research groups' scores in the achievement test of science

Group	N	Me an	Vari ation	d f	t- tes t	tab led	Signifi cance at (0.05)
experi mental	30	66.97	156.54	58	11.70	2	Signifi cant
Control	30	53.35	153.59				

It is clear from table (5) that there is a statistical significant difference between the degrees of students of the experimental group and the degrees of the control group in achievement and in favor of students of the experimental group and thus rejects the first null hypothesis.

To calculate the effectiveness of teaching with the strategy SWOM in the achievement of intermediate second students in the science

subject, the researcher used the Black equation, table (6) shows the ratio.

Table 6.

Black rate of the achievement test

Scores mean of pre-test	Scores mean of post-test	Maximum	Rate of Black	Level
26.44	66.97	30	12.73	High

From table (6) it is clear that the average rate of the achievement test towards the strategy SWOM is (12.73), which is higher than the ratio proposed by "Black" to judge the effectiveness of the strategy, which is (1.2), and therefore it can be judged on the effectiveness of the strategy that you used The researcher is effective, and he contributed positively to the achievement.

B- Verify the Second Null Hypothesis, Which States that

There is no statistical significant difference at the level (0.05) between the scores means difference in achievement for students of the experimental group that are studying science using SWOM strategy and the scores means difference in achievement for the control group students who study the same subject in the usual way in the retention test.

To verify the validity of the second null hypothesis, scores means differences in achievement were calculated for students of the two research groups in the retention test, and the results showed that the means of scores for the students of the experimental group were (68.14) and the variance (62.76), while the mean of scores for the control group (60. 47) and variance (55.31), and Table (7) illustrates this.

Table 7.

The mean, variance, and calculated and tabulated t value of the two groups of scores in the science retention test

Group	N	Me an	Vari ation	d f	t- tes t	tab led	Signifi cance at (0.05)
experi mental	30	68.14	62.76	58	3.81	2	Signifi cant
Control	30	60.47	55.31				

It is clear from table (7) that there is a statistical significant difference between the degrees of students of the experimental group and the degrees of the control group in the retention test for the benefit of students of the experimental group and thus rejects the second zero hypothesis.

To calculate the effectiveness of retention in the achievement of students of the second intermediate grade of science subject, the

researcher used the Black equation, and Table (8) shows the ratio of the average.

Table 8.
Black retention rate ratio

Scores mean of pre-test	Scores mean of post-test	Maximum	Rate of Black	Level
14.08	68.14	30	5.19	High

From Table (8) it is clear that the rate of retention rate towards the strategy SWOM is (5.19), which is higher than the ratio proposed by "Black" to judge the effectiveness of the strategy, which is (1.2). Therefore, it can be judged on the effectiveness of the strategy used by the researcher Effective, and it contributed positively to the retention of information.

abilities, as it works to increase the students' desire to investigate the facts and investigate the outstanding information through increasing the survey and the large number of questions and inquiries.

3. The "SWOM" strategy helps students to save and recall information, activate previous knowledge, organize new information, and transfer it from short-term memory to long-term memory (Attia, 2010: 161).

Interpretation of the Results

Results Related To Achievement Test

The results indicate the superiority of the experimental group that using SWOM strategy over the members of the control group that studied themselves using the traditional (regular) group. This can be explained as follows:

1- Strategic steps SWOM make students more able to retain information and knowledge and more able to remember by clarifying the main ideas of students and helping them to understand concepts and the relationship between them, all of which contributed to raising the level of achievement for students of the experimental group who studied the knowledge content by employing SWOM strategy in comparison Students of the control group who studied the content in the traditional (regular) way.

2- The employment of metacognition strategies improves academic achievement in academic subjects (Abu Jado and Nawfal, 2007: 350).

3- That the use of SWOM strategy was more influential than the traditional (regular) method in increasing achievement because it organizes the study material and splits it into steps arranged according to the strategy and they have had a positive impact on the educational process in making the learner the primary axis of the educational process and this is what education advocates.

Third: Conclusions

In light of the current research results, the researcher concluded the following:

1. SWOM strategy increases students' motivation towards learning science, with an educational environment of fun, suspense, reinforcement, challenge and competition.

2. SWOM strategy emphasizes the effective role of female students in the educational process to face life in the face of a conscious, knowledge-based foundation.

3. "SWOM" strategy provides an opportunity for competition and participation among all students at all levels.

Fourth: Recommendations

In light of the results of this research, the researcher recommends the following:

1. The necessity of adopting SWOM strategy in teaching science for second intermediate grade students for their effect on achievement and retention.

2. Inducting the educational supervisors to follow up the contribution of female teachers in diversifying teaching methods in light of technological advances.

3. Using new teaching strategies into curricula and teaching methods in colleges of education and colleges of basic education.

Results Related to Retention Test

1. The "SWOM" strategy leads students to interact with the lesson and increase their activity and focus as a new teaching method.

2. Teaching with a "SWOM" strategy affects positively the development of students' mental

Fifth: The Proposals

Complementing the current research, the researcher suggests the following:

1. Conducting a similar study in the subject of science to identify the effect of SWOM strategy on other variables, such as attitude,

acquisition of concepts, and tendencies toward matter and others.

2. Design a training program for teachers of science based on the strategy of SWOM and know its effect on achievement and retention.

3. Conducting a similar study in other levels, other subjects and on both sexes.

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