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The effect of Hawkins' Strategy on the Achievement of Second Grade Intermediate Students in Science curriculum

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Abstract

The study aimed to identify the impact of teaching science using Hawkins' strategy in achieving second-grade students. The experimental approach was adopted. The study sample consisted of (67 female students for the second intermediate grade from one of the Baghdad schools affiliated to the General Directorate of Baghdad Education, Karkh III, for the first semester of the academic year)/(2021/2022). The school was chosen intentionally. The students were divided into two divisions, one experimental and the number of its members (33 learnt according to the Hawkins strategy, while the other was considered an officer and the number of its members) (34 learnt according to the usual method. Teaching plans were prepared according to the Hawkins strategy and it was confirmed that the two research groups were equal, and the achievement test was developed, and after verifying its validity and stability, it was applied to the study members after the implementation of the experiment to achieve the research goal). The research result showed a statistically significant difference between the mean scores of the research personnel on the post-achievement test, which is attributed to Hawkins' strategy for the benefit of the experimental group. In the light of these results, the research recommended that science teachers use Hawkins' strategy in teaching science.

Keywords: Hawkins Strategy, Achievement.

CHAPTHER I

L Research problem: BSurvey of ten science teachers for the second intermediate grade, the question and answer was as follows:

1- What teaching method do you use in science for the second intermediate grade? The answer was that (87%) of them answered using the lecture and interrogation method only, and (13 of them answered using the discussion and exploration method %). Also, a number of studies such as (Asadi 2005 and (Abdul Amir), et al. 2008 showed that there is poor achievement in science in the second intermediate grade and attributed those studies to the fact that they use traditional methods based on conservation and indoctrination). Therefore, the researcher felt that there is a real problem that needs to be studied by experimenting with Hawkins' strategy in teaching science, which she expects to increase the achievement of students. The research problem was identified by answering the following question:

- What is the impact of Hawkins' strategy on the achievement of second-grade intermediate students in science?

The importance of the research: The importance of the current research can be deduced as follows:

1- The scarcity of previous studies that dealt with this subject within the limits of the researcher's knowledge and knowledge.

2- This study may provide an opportunity for science teachers and students to learn about

the Hawkins method and how to employ it in teaching science for the second intermediate grade.

3- The study could also provide an additional theoretical framework on Hawkins' strategy and enrich the Iraqi library with a new study on it .

4- Benefiting from its results in the evaluation and development of the science curriculum, especially in the intermediate stage of education .

Objective of the research : The current research aims to define: "The impact of Hawkins' strategy in the achievement of second-grade students".

The research hypothesis: - To verify the goal of the research, the following zero hypothesis was formulated:

There is no statistically significant difference at the level of ((0.05 between the average achievement scores of female students of the experimental group LAT studying using the Hawkins strategy and the average achievement scores of female students of the control group LA T studying using the usual method in the achievement of science subject)).

Research Limits: The current research was limited to: The first and second modules of the Science Book for the second intermediate grade.

Definition of terms: -

1- Hawkins Strategy: Defined (Hawkins: 2002) as "a set of procedures and practices based on giving the learner the freedom to learn and wonder and be in three stages (circle, triangle and square)" (Hawkins: 2002,63))

The researcher defined it procedurally as a set of steps carried out by the researcher in the teaching of science and consists of three stages, namely the circle (the stage of openness and freedom), the triangle (the stage of directed exploration) and the square (the stage of discussion and reaching results) .

2- Ismaili achievement::: Defined by 2019) "Ismaili" (: 2019, 39) as a specific level of performance and efficiency in the school work as it is performed by teachers or by standardized tests or both

The researcher defines it procedurally as "the amount of knowledge and information achieved by second-grade intermediate students in the subject of science measured by the degree obtained by the student as a result of her response to the paragraphs of the achievement test prepared for that".

Chapter 2:

First : Theoretical Background

Hawkins Strategy:Hawkins has pointed out that the teaching of basic science should be done in three stages, symbolized by geometric shapes: circle, triangle and square. And the use of symbols to denote the stages of ye instead of numbers, so as not to suggest to the reader the need to arrange at these stages . The three phases are explained below. (Hawkins:2002 Al-Khalili et al., 2004 Al-Rawashda et al., 2003, Al-Nashif 2009)

- Circle stage (the stage of openness and freedom) : The shape of the circle indicates that there is no starting point or end point for it, in the sense that there are no restrictions. Therefore, it represents the stage of tampering /freedom(a stage, and at this stage it leaves the learner room to play and deal with the tools freely and think about their use and what can be used without the intervention of the teacher, but at the same time the teacher must give instructions for the safety of the students and monitor the learners to protect them from any improper disbursement of chaos). The stage lasts a few minutes, not exceeding ten minutes .

- The triangle stage (the guided exploration stage) : The shape of the triangle symbolizes guidance and guidance, and it is called eye The phase of guided exploration, the teacher shows his students how to implement the activity and the steps of Te verbally or as a practical procedure, and the teacher allows his students to record data, and directs them to discover the concept, principle or content to be learned. The phase takes time depending on the type of activity from (15-20 minutes).

- The box stage (the discussion stage and reaching the results) : It is the last stage of the Hawkins method, and the box symbolizes the

learners sitting with their teacher for dialogue and discussion in the results they get. The role of the teacher in the eye stage is to conduct dialogue and discussion, and formulate the scientific concept, principle or generalization . He asked some questions to evaluate students' learning. This phase will take approximately ten minutes .

Hawkins' view and philosophy of teaching science based on the three stages (circle, triangle, and square) has contributed to modern strategies in the teaching of science, as it formed one of the pillars that led to the development of the growth of the yc triple learning cycle, to be known as the modified five-year learning cycle.

 Achievement : The importance of the student's and teacher's academic achievement lies in revealing the student's academic level through their degrees, as well as determining individual differences between them. It also helps to know the quality of the means and methods used in the student's education, as well as enabling parents to follow their children. From the above, academic achievement is of great importance in linking the student to the subject. Through his achievement, it is possible to know the extent of this correlation between the subject, or the teacher's method and performance. It also allows parents to determine the level of their children. (Al-Musawi : 2015, 262)

Academic Achievement Objectives: Academic achievement has many objectives, including:

- Determine the learner's result in order to move on to another stage.
- Determine the type of study and specialization to which the learner will move from one stage to another .
- Identify the individual abilities of learners . (West & Pennell: 2003,127)

The importance of measuring achievement is shown by a number of indicators:

- Increasing motivation among students and urging them to achieve and educate .
- Help predict students' knowledge acquisition and enforce their success in other subjects.
- Help determine if the student has mastered the vocabulary of the studied subject .
- Assist in judging the effectiveness of the model or teaching strategy .
- Diagnosis of learning difficulties in order to regulate the methods of treatment.
- Assist in determining the different levels of students and classify them according to their abilities and desires .

Shalabi (2000, 143)

Second : Previous studies:

Table (1): *Studies dealing with Hawkins strategy*

Researcher's name	Main aim of the Study	Place	Sample	Tools	Statistical means	Results
Al Hashim (2017)	Learn about the effectiveness of Hawkins' strategy through an enrichment program in teaching science to develop innovative thinking and achievement skills among third grade primary students in the State of	KUWAIT	(62 students) (32 students for the experimental group and (30) students for the control group	Achievement Test and Innovative Thinking Test	Arithmetic media, standard deviations, and a "t-test" to test the differences between the two groups and Vacronbach.	There is a statistically significant difference between the averages of the scores of the students of the experimental and control groups in the post-application of the achievement test as a whole and its four dimensions in favor of the experimental. There is also a statistically significant

	Kuwait .					difference between the two groups in the post-application of the innovative thinking test in favor of the experimental group.
Al-Adili (2019)	Identify the impact of teaching science using the Hawkins method in developing the love of scientific inquiry among students in the intermediate basic stage.	Alulbayt University/ Jordan	(65 students) (32 students for the experimental group and(33) students for the control group	curiosity scale	Test "t" to test the differences between the two groups and vacaronbach	There is a statistically significant difference in favor of the experimental group over the control of the impact of the Hawkins method in developing the love of scientific inquiry.

Chapter 3:

This chapter deals with a review of the procedures followed to achieve the objectives of the research and its hypotheses, which are the test of the experimental design, the identification of the research community, the testing of a sample and the procedures for building an achievement test, and the statistical methods adopted in the analysis of the results of the research, as follows:

First : Experimental design: - It isdefined as "the approach in which the researcher uses experience to reach results, and represents the state of transition from the theoretical scope to the applied field" . Abboud; 2009, 138)where the researcher chose the experimental design with partial adjustment with the post-test for two independent groups, one of which is set for the other, and one of which represents the experimental group that is studying according to the Hawkins strategy, and the other control that is studying in the usual way, Table No. (2) shows the experimental design of the research variables

Table No. (2)

group	**Équivalence**	**The independent variable**	**Post-test** **Dependent variable**
Experimental	- Prior information - IQ - previous collection - Parents' academic achievement	Hawkins Strategy	Collect
Control group		The usual way.	

Second : The research community and its sample: -

The research meeting -/(2021/2022) represented the current research community with second grade students, average in the intermediate schools affiliated to the Directorate General of

Baghdad Education Karkh III, for the academic year).

B - The research sample: "Khadija Al-Kubra Middle School" was chosen intentionally from among the schools of the research community because of its proximity to the researcher's residence, and for the cooperation of the school administration in overcoming the potential difficulties facing the researcher and the school's containment of three divisions, in order to give the freedom of random appointment to the experimental and control groups.loo

The research sample was chosen by simple randomization, my division of ((A, C72)) student, and selected ((35 ca)) to represent the experimental group that will be studied according to the Hawkins strategy, and a division to represent the control group that will be studied according to the normal method, by (37) students of the experimental group, and a student of the control group, and then two students who failed in the experimental group, and three students from the control group were excluded statistically from the experience data while keeping them in their classrooms in order to preserve the school system, because they have previous experience in the topics that are studied in the duration of the experiment, which may affect the accuracy of its results, and thus the final number of the research sample (67) students by 33 students for the experimental group and (34 students for the control group). As in Table (3)

Table No. (3) *Distribution of female students of the research sample of the experimental and control groups*

group	**Section**	**Sample Individuals:**	**Number of Failures**	**The final number of sample members**
Experimental	c	35	2	33
Control group	a	37	3	34
Total	**Divisions**	**72**	**5**	**67**

Third : The equivalence of the two research groups: The equivalence between the two groups of the research sample was conducted in a number of variables that the researcher believes affect the results of the experiment, (previous achievement, intelligence test, previous information, parental achievement) and the results showed that they are all equivalent .

Fourth : The external safety of the experimental design (adjusting the external variables): Despite the statistical equivalence procedures carried out by the researcher between the experimental and control research groups in four variables, whose overlap may have that common effect with the independent variable (Hawkins strategy) in the dependent variable (achievement) , the researcher tried as much as possible to avoid the impact of the number of external variables in the progress of the experiment, and then in its results, all the following external variables were controlled, and in the following procedures to adjust some of these variables:

1- Experiment conditions and associated incidents.

2- Experimental extinction.

3- - Processes related to maturity .

4- Measurement Tool

5- - Impact of the experimental procedures: a-Confidentiality of the research. B-The duration of the trial. (C) Conducting the experiment.

Lessons Distribution - The researcher controlled this factor by distributing the lessons equally (in agreement with the school administration) between the experimental and control research groups, and a table (3 shows this).

Table (4) *Distribution of science classes to the two research groups*

group	Today	Lesson	Time
Experimental	Tuesday	First	20:00
	Wednesday	Fourth	10:25
Officer (a)	Monday	Fourth	10:25
	Wednesday	First	20:00

Fifth: Research Requirements:

1-Determination of the scientific material: Before the start of the application of the experiment, the scientific material was determined, as it included the first and second units that are taught within the annual plan for the content of the science material during the first semester of the academic year (2021-2022) for the second intermediate grade, 1st grade, for the year 2017, as follows:

• Module One : Elements and Vehicles

Chapter One : Elements and Chemical Correlation

- Lesson 1 : Atomic construction of elements (valence electron)

- Lesson 2 : Chemical bonds

Chapter II : Chemical compounds

- Lesson 1 : Ionic and covalent compounds

- Lesson 2 : Intermolecular correlation forces

• Module Two : Chemical reactions and solutions

Chapter Three : Chemical Formulas and Reactions

- Lesson 1 : Chemical Formulas and Equations

- Lesson 2 : Chemical reactions and their types

2- Formulating behavioral goals The setting of behavioral goals is very important, as it facilitates the process of selecting the appropriate experiences and selecting the appropriate aspects of activity for the learners, as well as helps the teacher in choosing the method of teaching, the teaching methods and the evaluation methods appropriate to the content of the educational material: (: Zoroqi, Zouya 2017, 91).The behavioral goal is a carefully and clearly formulated phrase to describe the expected change in the behavior of the learner that he is doing after passing a new educational experience related to the vocabulary of the lesson to be learned and the concepts contained therein, as it can be observed and measured the greatest, and Abdul Razzaq "(: 2018, 83-84).

Therefore, the researcher formulated (217 behavioral goals, in light of Bloom's classification in the cognitive field, as the behavioral goals were distributed, remembering, comprehending, applying, analyzing, synthesizing, and evaluating, respectively, because it is one of the most common, preferred and used classifications) (). Bloom: 1983,107).

In order to ensure the validity of the behavioral goals and their representation of the content of the subject covered in the experiment and the integrity of its derivation, the researcher presented it to a group of experts and arbitrators with specialization in the field of education, psychology and methods of teaching science. Accordingly, the level of agreement between opinions reached (87%) according to Cooper's formula for the agreement. Some of these goals were modified and other purposes were reformulated, until they were finalized. Table (5) shows the distribution of behavioral goals between levels and academic content.

Table (5) *Distribution of behavioral goals and their levels to academic content*

No.		Levels / Content Taught	Cognitive feild						
			Recall	**intake**	**application**	**Analysis**	**structure**	**calendar**	**Total**
Chapter 1	Chapter One	Elements and chemical bonding	36	16	14	8	5	3	82
	Chapter 2:	Chemical compounds	15	23	5	9	2	5	59
Chapter 2.	Third chapter	Chemical formulas and reactions	24	24	12	8	5	3	76
Total			75	63	31	25	12	11	217

3 Preparing teaching plans -: (20) As the preparation of teaching plans is one of the requirements of successful teaching, the researcher prepared teaching plans to teach science to the students of the two research groups and reached a teaching plan of (10) for the experimental group according to the steps of the Hawkins strategy, and similarly for the control group according to the usual method). The researcher presented examples of plans to a group of arbitrators and specialists in methods of teaching science, to explore their opinions, observations and proposals to improve the formulation of these plans, and make them sound to ensure the success of the experiment, and in light of what the arbitrators showed, some necessary amendments have been made to them, and they are ready for implementation.

Sixth: The research tool: The current research requires the preparation of a tool to measure the variable (achievement in the subject of science), and from this tool we can learn about the extent of achieving the goal of research and hypothesis, and what follows is a presentation of the steps of preparing the tool.

Preparations of the achievement test Mikhail -:2015)): An objective test of the type of the multiple test was prepared to measure the achievement of thefemale students, as it is considered that the achievement test is one of the most important and most used objective tests because of its use in measuring many levels of learning, and characterized by the positives when applied and with a high degree of stability and honesty, in which the percentage of guesswork is low and the conditions of objectivity and accuracy are met in the 2015 correction 115). Mihail

The steps for preparing the achievement test are :

1. Define the objective of the test.
2. Determine the scientific material.
3. Preparing a table of specifications (test map) : The test map (table of specifications) aims to be comprehensive by distributing the paragraphs of the achievement test to the various parts of the scientific material according to the levels of behavioral purposes defined homogeneously.

Thus, the paragraphs of the achievement test were distributed between the classes of the subject and the levels of the cognitive field more accurately, and Table (6) shows this.

Table No. (6) *the test map for the achievement test paragraphs*

Terminations	Number of pages	Materiality	Objective Level						Total 100%
			Recall 34%	intake 29%	application 14%	Analysis 11%	structure 6%	calendar 6%	
The first	14	37%	4	3	2	1	1	–	11
Second	11	29%	3	3	1	1	–	1	9
The third	13	34%	3	3	1	1	1	1	10
Total	38	100%	10	9	4	3	2	2	30

Building the paragraphs of the achievement test 4 -:. Adopting a table (5), the researcher formulated (30) paragraphs (one of which is objective of the type of multiple choice, with four alternatives, one of which represents the correct answer for levels 23, remembering,understanding,applying) and(7) analysis,composition, and evaluation) article paragraphs for levels ().

5- Drafting test instructions:

A- Answer instructions: The researcher prepared an instruction sheet attached to the test paper that included information about the students (name, class, division, school) and the purpose of the test and not to leave any paragraph without an answer or a test of more than one paragraph and not to write on the test paper but on the answer sheet attached to the test according to the illustrative example with confirming the writing of the answers clearly and according to the sequence in the place designated for the answer.

B-(Correction instructions 1-23) After the test paragraphs were drafted and the type was chosen, the researcher prepared the typical answer to its paragraphs , as it relied on it to correct the test, and a standard was set to correct the answers, as each of the test paragraphs was placed one degree if the answer is correct and zero for the wrong or left answer, while criteria were set to correct the article questions (24,25,27,28,29) of the test paragraphs if the answer is correct and zero if the answer is wrong, while the answer to paragraph (26) was set four degrees if it is correct and zero if it is wrong or left, while the paragraph (30) was set three degrees if it is correct and zero if it is wrong or left, thus the total score of the achievement test ranged between (0-40).

6- The validity of the test The validity of the test was verified by: (apparent validity, content validity)

7- The exploratory application of the achievement test was in two stages :

• The first exploratory experiment: The aim of this procedure is to know the clarity of the paragraphs and instructions and the duration of the student's response and the questions she raises about the achievement test items. Therefore, the researcher applied the test to a first sample of second grade students in an average school (middle of chastity for girls)affiliated to the General Directorate of Baghdad/Karkh Education, which is composed of (30) students, and after agreeing with the school administration and the school of the subject to conduct the test after the completion of the study of the first and second units of the science book for the second intermediate grade, 1, 2017. It was found that the test instructions and paragraphs were mostly clear and understood by all students, and no inquiry was made from the students indicating the contrary . The time of application of the test was also calculated by calculating the average time of the first (3 students who answered the test added to it from the last) (3 students who answered the test, and the average time was calculated. The time taken by the students to answer the test paragraphs was (42 minutes, and using the following equation):

Average time range =

$$\frac{\text{(Three female students last average time} + \text{three female students first average time}}{2}$$

The average time the first three students answered the achievement test items = 39 minutes

The average response time of the last three students to the achievement test items = 45 minutes

Average time = 39 + 45 + 84 ÷2 = 42 minutes

• The objective of the second exploratory experiment is to conduct statistical analysis and extract the psychometric properties of the achievement test paragraphs by finding the values of the difficulty, ease and discrimination coefficient to evaluate the test paragraphs, that is, to judge their validity or not to achieve the objectives of the test and to determine the efficiency of those paragraphs 2009, 366 - 367).

The researcher applied the test to a second exploratory sample consisting of (100) second-grade intermediate students at a school (Al-Zahraa Medium)affiliated to the General Directorate of Baghdad Education/Karkh III who completed the study of the first and second units of the science book for the second intermediate grade, 1st grade, 2017 The researcher followed the following steps:

1_I corrected the answers and calculated the total score for each student 1-.

2_The scores are arranged in descending order for the purpose of statistical analysis

3- I took the highest of the female students' answers to represent the upper group and the lowest 27% 27% of the female students' answers to represent the lower group, as Abu Libdeh (:2008) indicated that if the sample size is 100 or more, a percentage of the upper and lower category (Abu Libdeh 27%) is adopted (: 2008, 309, thus the number of female students in both the upper and lower group is 31 students, the psychometric properties of the test were calculated as follows): -

Difficulty and ease coefficients for the paragraphs -: (The difficulty coefficient for the objective test paragraphswas calculated by applying its own equation, and it was found that the value of the difficulty coefficient for the objective test paragraphs ranged between 0.31- 0.7.4),where all paragraphs are of acceptable difficulty according to the Bloom criterion because they are between (0.20-0.80).

Discriminatory coefficient of paragraphs -(0.The marking coefficient for each of the objective test paragraphs was calculated by applying its own equation and was between 33 - 0.70).

C The effectiveness of the wrong alternatives -: The effectiveness of the wrong alternatives was calculated for the achievement test paragraphs (- objective paragraphs by applying the effectiveness equation of the alternatives were all negative results ranging from 0.035 to -0.185)

D-Stability:It was calculated as follows:

1- The stability of the paragraphs of the substantive questions. The researcher used the Kjoder equation (- Richardson 20), where it reached (0.87).

2- Stability of the paragraphs of the article questions: The researcher adopted the formula of Cronbach's alpha (_)to find the coefficient of stability of the article paragraphs in the achievement test,where the coefficient of stability was (0.82).

3- Stability of the correction of the article questions and their percentage reached (0.98)

Sixth : Procedures for applying the experiment:

1- The researcher agreed in the first semester of the academic year (2021-2022AD, with the management of the school in which the experiment will be conducted and its teaching staff on the need not to inform the students about the purpose and nature of the research and that the researcher has been newly assigned to the school as a teacher of science for the second intermediate grade).

It was agreed with the school administration to organize the schedule of science lessons at the rate of two lessons per week for each of the two research groups 2- experimental and control ().

3- The researcher began actual teaching and applying the experiment to the students of the two research groups on (10/11/2021) and the experiment ended on (20/1/2022) of the academic year (2021-2022).

4 The experimental group was taught according to the Hawkins strategy and according to the daily teaching plans prepared according to the steps of the Hawkins strategy. As for the control group, it was taught in the same time period and in the usual way according to the teaching plans prepared for that.

5- The post-achievement test was applied to the two research groups on Thursday (20/1/2022, and the students were informed of its date a week before the specified date, and there were no absences with or without excuse, and the researcher herself supervised the application of the test).

The researcher conducted the statistical processing and analysis of the results and their interpretation of the answers of the students of the two research groups 6.

Seventh : Statistical means: The researcher used a number of statistical means in her research procedures

Chapter 4:

After the researcher completed the research experiment according to the steps she referred to in the previous chapter, she analyzed the results she reached to find out the impact of Hawkins' strategy in achieving second-grade intermediate students in science and identifying the significance of the statistical differences between them, and then verifying the research hypothesis.

First :Presentation of the results: For the purpose of verifying the zero hypothesis that states that:

There is no statistically significant difference at the level of significance (0.05 between the average scores of students who study according to the Hawkins strategy and the average scores of students who study according to the normal method of teaching in the achievement test).After correcting the students' response papers and calculating the total score for each student in the two groups, the mean and standard deviation of the two groups were calculated, as shown in Table (7).

Table (7) *T-test results to find out the significance of the difference between the average scores of the experimental and control groups in the achievement test*

Variable	group	Number	Mean	standard deviation	T value		Significance 0.05
					Calculated	tabular	
post-achievement test	Experimental	33	31.85	4.353	10.817	2	Function in favor of experimental
	Control group	34	22.41	2.595			

- It means the difference between the averages of each of the experimental and control groups in the achievement variable divided by the standard deviation of the control group, and helps us to know the size of the impact on determining the amount of the relative impact of a particular educational treatment, and to determine the level of impact there is a standard where the size of the impact ::: The size of the impact of the achievement variable (0.86, and therefore the size of the impact in Hawkins' strategy on collection is high).

Second : Interpreting the results:After the results of the experiment appeared and showed the excellence of the experimental group's students over the students of the control group in the post-achievement test of the science subject, this is due to several reasons according to the opinion of the researcher:

- That teaching according to the logical sequence of the Hawkins strategy, including the stages and steps sequenced and organized in a manner consistent with the content of the planned scientific subjects that the researcher used with the students of the experimental group, provided opportunities for students to practice alternative methods of traditional school learning, which provided opportunities for the majority of students to improve their scientific level and thinking .

- The Hawkins strategy has helped students who are excited and motivated about everything that is new and leads to better results, because it allows students to rebuild the material, process ideas, arrange and organize them in a special way, so this understanding is for the better .

- Teaching using the Hawkins strategy contributes to keeping the information in the memory of students for a longer period, because students have reached the formation of their own cognitive structure, and this therefore weakens the factor of forgetting because the results of what the student gains from information and experiences as a result of her effort and diligence.

- It made students feel that they have an important role in the learning process through direct participation by strengthening the process of student participation. Her colleagues in building meaning led to the development of the skill of communication among them in a positive way through discussion and exchange of ideas, which led to positive learning .

- Hawkins' strategy inspires in the same students a spirit of vitality, activism and spirit of cooperation and love of sharing the lesson.

- The use of Hawkins' strategy in teaching increases the interaction between students with each other and allows them to express opinions, put forward ideas, and generate a mental image, which leads to meaningful learning, which raises their scientific level and becomes more serious and deductive in the application of what they have learned.

Conclusions:

In light of the results of the current research, the researcher was able to conclude the following:

1. The results of the research showed a positive impact on the use of the Hawkins Strategy, which contributed to raising the achievement of second-grade students of average and impact size (0.86).

The researcher noticed through the application of a strategy that it encourages the spirit of cooperation and positive competition among students and inspires them with enthusiasm and vitality 2.

Recommendations:

In light of the results of the research and its conclusions reached, the researcher can recommend that attention be paid to involving female students in learning,and teaching the subject of science at different stages of study according to Hawkins' strategy for its impact on achievement,organizing training courses for science teachers on how to use Hawkins' strategy under the supervision of qualified trainers to teach and train them.

Proposals:

Complementing the research and its development, the researcher proposes to conduct a similar study using the Hawkins strategy for different stages of study,and for other dependent variables.

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