

The impact of the five-finger strategy on science achievement among first-grade intermediate students in science and their creative thinking

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## **The Impact Of The Five-Finger Strategy On Science Achievement Among First-Grade Intermediate Students In Science And Their Creative Thinking**

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### **Abstract:**

This research aims to know the impact of the five fingers strategy on the achievement of science subject for first-grade intermediate students and their creative thinking, the researcher chose first-grade intermediate students from (Al-Jawahri) Intermediate School for Boys affiliated to the Directorate of Education - Karkh First / Baghdad for the academic year (2020-2021) for the purpose of applying the experiment, the sample consisted of (64) students, (32) students in the experimental group that is taught according to the five-finger strategy and (32) students in the control group that are taught in the usual way, and the scientific subject to be taught was determined, which included three units (Part One) ) From the book of the entire science subject dedicated to teaching for the first intermediate grade for the year 2021 AD, the 387 behavioral objectives were formulated in the light of the general objectives and according to Bloom's classification of the cognitive domain at its first five levels (remember, comprehension, application, analysis, synthesis ), as for the research tool, it has prepared an objective achievement test of a type of multiple choice consisting of (35) items according to the test map (specification table), and the Torrens Scale of Creative Thinking, consisting of (40) items, was adopted, and the researcher was ascertained of its honesty, stability and psychometric properties, the researcher applied the experiment in the first semester of the academic year (2020-2021) AD, as the experiment started on Sunday (29/11/2020) and ended on Wednesday (17/2/2021) after applying the post-achievement test, the experiment lasted (10) weeks, with four lessons per week for each group, and the researcher studied the two groups himself.

**Keywords:** the five-finger strategy, achievement, creative thinking.

First: The research problem: The results of previous educational studies and research in the field of science teaching methods were praised, such as (Al-Akedi, 2017), (Al-Saadi, 2015), (Al-Masoudi, 2016), (Hussain, 2017), (Abdulkarim, 2019) and (Al-Amri, 2020) and (Muhammad, 2020), to the teachers' failure to use modern teaching methods and their limitation to memorization and indoctrination, it attributed the reason for this to the large volume of the textbook, which is full of information, so the teacher cannot complete it in the time specified for him, which forces him to explain, interrogate, and shorten the curriculum.

This prompted the researcher to look at teaching strategies to diagnose and solve this problem, he chose the five-finger strategy as it represents the modern trend in teaching, in addition to the lack of studies conducted within it to prove its effectiveness at the scientific level, according to the researcher's knowledge.

Here lies the research problem in answering the question:

**What is the impact of teaching science using the five-finger strategy on the achievement of first-grade intermediate students and their creative thinking?**

**Second: Research Importance:**

- The current research is the first research in the Iraqi environment, which deals with the strategy of the five fingers in the achievement of first-intermediate students in science and the development of their creative thinking.
- Increasing awareness among science teachers in educational institutions of the importance of active learning strategies, including (the five-finger strategy)
- The current research contributes to finding solutions to the problems of weakness in the level of achievement for learners of science for the first intermediate grade by presenting the material with a different strategy that may increase their level of achievement and thinking.
- The current research encourages many researchers working in the educational field to conduct more research and studies on active learning strategies.

**Third: Research aim:** The current research aims to identify "the impact of the five-finger strategy on the achievement of first-grade intermediate students and their creative thinking."

**Fourth: The two research hypotheses**

- 1- There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who studied according to the five-finger strategy and the average scores of the control group students who studied according to the usual method in the achievement test for science.
- 2- There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who studied according to the five-finger strategy and the average scores of the control group students who studied according to the usual method in the creative thinking test.

**Fifth: Limitations of Research**

- 1- Human limit: Students of the first intermediate grade in middle and secondary schools affiliated to the General Directorate of Education in Baghdad / Karkh First.
- 2- Time limit: the first semester of the year (2020-2021)
- 3- Knowledge limit: The subject was specified in the first units of the science textbook for the first intermediate grade. (First Edition), and the year (2020-2021)

Sixth: Define terms

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- **The Five Fingers** defined by (Ambo Saidi and Al-Hosanieh, 2016): One of the active learning strategies called the (hand chart) strategy, its idea is based on the learners drawing a blueprint for their hands, and writing the questions for the lesson on their fingers, and through what they wrote of questions, the discussion between the groups is carried out according to pre-prepared plans” (Ambo Saidi and Al- Hosanieh, 2016: 482)
- **Achievement** defined by (Al-Saleh, 2006): “The knowledge that is obtained or the skills that students acquire from the course, and the level of each student is determined through the test scores that are set by the teacher of the subject” (Al-Saleh, 2004: 26)
- **Creative thinking** defined by (Razouki and Abdel Karim, 2013): “It is one of the good skills that lead us to a purposeful and complex mental activity to guide the learner’s strong desire to search, investigate, generate ideas and solutions to the problems facing the human mind to create open thinking characterized by depth that leads to the production of more From creativity” (Razouki and Abdul Karim, 2013: 110)

## **Chapter Two: Theoretical framework and previous studies**

It is one of the active education strategies, and it is based on the constructivist theory, which appeared in the last years of the twentieth century, with the beginning of the twenty-first century, interest in it increased clearly, it emerged as one of the contemporary educational trends that have a positive impact on the educational process inside and outside the classroom, the massive knowledge explosion has an effective and powerful role in its emergence as a result of electronic knowledge social networking sites via the Internet, which have countless references, periodicals, articles, studies and empirical research, all of which contributed to increasing the clarification of the concept of active learning and the importance of applied fields in various educational disciplines, school and university . (Saada et al., 2006:21)

### **The five-finger strategy**

At the beginning of the lesson, the teacher introduces the material (the topic) in a traditional way by explaining the topic in a lecture method.

- 1- Divide the learners into groups
- 2- The teacher distributes colored papers containing the outline of the fingers (hand) to the learners or directs them to draw the palm of their hand containing their five fingers.
- 3- The teacher asks the learners to write questions about the topic, answer the questions written on each finger, and focus on the main topic of the lesson. (Zayer and others, 2014: 244), (Yassin and Zainab, 2012: 132)

### **Five finger strategy features:**

- Develop social skills among learners.
- Breaking the monotony as it allows learners to move.
- Create a connection between the processes they learn and the mental processes.
- Development of motor intelligence.
- Create an atmosphere of activity and fun in the classroom.

- It makes it easier for the learner to understand the content of the lesson through five main points.
- Develop the positive tendencies of the learners towards the subject.
- Creating an atmosphere of competition between groups. (Al-Shammari, 2012: 56)

### **The second axis: previous studies**

**Study (Mohammed, 2020):** The study was conducted in Assiut Governorate \ Egypt

- It aimed to identify the impact of using the notebook hand model supported by the revision process in treating writing errors among sixth graders.
- The sample was selected from the sixth grade students from the Ghuraba Thabet Basic Education School, and it consisted of (30) students.

The researcher followed the experimental research method using the quasi-experimental one-group design.

- **Study tools:** Prepare the teacher's guide and student's notebook according to the model of the notebook hand supported by the revision process, and repeat the test for writing errors.
- **Statistical means:** T-test, Pearson correlation coefficient, Alpha Cronbach's coefficient, standard deviation, and the spss statistical package were used.
- The researcher calculated the impact size of the test errors, which amounted to (0.93), which is a significant value.

**The results of the study:** The effectiveness of the hand-idea model supported by the revision process in treating written errors among sixth graders of primary school was proven.

**Results:** There is a statistically significant difference at the level (0.01) in favor of the post-test in the experimental group between the mean scores in the pre-application and the post-application of the test (Mohammed, 2020: 113).

- Study (Al-Akedi, 2017): The study was conducted in Iraq.
- It aimed to identify the impact of using the strategy of the metacognitive learning cycle on the acquisition of physical concepts by first-intermediate students and their creative thinking.
- The sample size is 153 middle school students.
- Statistical means: Z-test for two independent samples, analysis of variance, and Keuder-Richardson-20 equation.
- **Study tools:** a test of physical concepts and a test of creative thinking, which consisted of (8) paragraphs. Each paragraph indicates a situation in which one of the skills of creative thinking is measured, respectively, sensitivity to problems, fluency, flexibility, and originality.
- Results: The students of the experimental group who studied according to the strategy outperformed the students of the control group who studied according to the usual method in the creative thinking test. (Al-Akidi, 2017: 87)

### Chapter Three: Research Methodology and Procedures

1- **Research Methodology:** The researcher followed the experimental method to achieve the goal of the research, and it is considered one of the appropriate and accurate scientific research in terms of hypotheses.

It is likely that there is a relationship between two variables related to a phenomenon, assuming the influence of the variables in one way or another on the dependent variable. (Al-Atbi and Al-Hiti, 27:2011)

2- **Research procedures:** The experimental design is considered a blueprint and work program for how to implement the experiment, and an arrangement of the circumstances and factors surrounding the studied phenomena and their observation (Anwar and Zankaneh 2008: 117). It also includes scientific and practical accuracy and reaches results that can be taken in answering the questions posed by the research problem and verifying the research hypotheses because of its great importance. (Al-Zoba'i, 1981: 102).

Therefore, this approach was adopted as it represents the transition from theoretical processes to applied processes to reach the results and reveal the relationship between two variables (Abboud, 2009: 138).

#### Design (1) Experimental Research

##### Second: the research community and its sample

- 1- **Research community:** where the current study community is all students of middle schools for boys affiliated with the General Directorate of Education of Baghdad Governorate - Karkh I for the academic year (2020-2021), as the number of schools in it was (89) schools and the number of students was (13015) students.
- 2- **The research sample:** Division (A, D) was chosen a simple random selection, numbering (64) students, and by lottery, the choice was made that Division (A) be experimental, which will be studied according to the five-finger strategy, with (32) students and Division (D) control, which will be taught according to the usual method, by (32) students.

The group	parity	independent variable	dependent variable
Experimental	- chronological age - Previous achievement in science	Teaching according to the five-finger strategy	- achievement - dependent variable
control	- Test the previous information - Creative thinking test - IQ test	Teaching according to the usual method	

### **Third: Equivalence of the two research groups**

Equality has been achieved in some of the variables that affect the independent variable (the five-finger strategy) in the two dependent variables (achievement and creative thinking), which are:

- Age in months.
- Previous achievement in science in the sixth grade of primary school (2019-2020).
- Test the previous information in the science subject.
- IQ test.
- Creative thinking scale.

### **Fourth: Identify and control extraneous variables**

One of the important experimental work procedures is for the researcher to precisely control certain factors or variables that may affect internal and external safety in order to verify how a particular situation or incident occurs and determine its causes (Vandalin, 1985: 348).

### **Fifth: Research requirements**

1- Determining the course material 2- Determining the units of study 3- Formulating behavioral objectives 4- Preparing teaching plans

### **Sixth: The study tool**

In order to achieve the research and its null hypotheses and measure the impact of the independent variable on the two dependent variables.

### **Seventh: Executing the experiment**

The researcher started the application on the research sample (experimental and control) starting from Sunday (29/11/2020) to Wednesday (17/2/2020) in the first semester with four lessons per week for the two groups (A and D).

### **Eighth: Statistical Means**

The results were analyzed and processed statistically using appropriate statistical methods.

## **Chapter Four: Presentation and Interpretation of Results**

The chapter includes a presentation of the research results in light of the research objective and its null hypotheses, and explains those results, conclusions and suggestions reached by the researcher:

First: Presenting the results after the researcher relied on the results of the two dimensional variables test, showing the superiority of the experimental group students over the control group students in the post test, where the arithmetic mean and variance of the experimental group scores were (28,34) and (26,23), respectively, which is higher than the arithmetic mean For the scores of the control group (18,21) and (10,49)

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By using the t-test for two independent samples, it appeared that the difference was statistically significant at the level (0.05) in favor of the students of the experimental group, as the T-value was (14.56), which is greater than the tabular value of (2) and with a degree of freedom (64), as in the table (2) explains that:

**Table (2) T-test results for two independent samples of the experimental and control groups in the achievement test**

the group	Number	Arithmetic average	Standard deviation	Degree of freedom	T value		Significance level 0.05
					Calculated	Tabular	
Experimental	32	28,34	5,19	64	14,56	2	Statistically significant at the level of 0.05 and in favor of the experimental group
Control	32	18,21	3,24				

**Second, the interpretation of the results**

Interpretation of the results of the first hypothesis (the five fingers)

- 1- Teaching according to the five-finger strategy creates an atmosphere of interaction between learners, and this was manifested through the activities, suspense and clear movement that they show inside the classroom, and the information they acquire in an atmosphere of fun and suspense and remain in their minds for the longest period, including which is positively reflected on the achievement.
- 2- The five-finger strategy helped transform the study material from a difficult and dry subject to an interesting and flexible subject for learners, which led to its easy understanding and tendency for it.
- 3- Providing immediate feedback that has a significant impact on encouraging learners to continue in the learning process.
- 4- The five-finger strategy helps deliver information to the minds of learners in an effective and enjoyable way, within a presentation made by their colleagues of the shape of the colorful hand that they like.
- 5- The Five Fingers strategy is one of the active learning strategies that make learners participate in the learning process and their positive role in the classroom.

**Third: Conclusions:** In light of the results, the researcher reached the following conclusions:

- 1- The five-finger strategy, which contributed to increasing the achievement of first-intermediate students in science compared to the usual method.

- 2- The strategy helped to favor teamwork among the learners, and to create an atmosphere of love and respect characterized by competition and enthusiasm for the lesson.
- 3- The five-finger strategy has proven successful in making students the focus of the educational process, and this is what all strategies with active learning aim at.
- 4- The strategy helped to activate the positive role of the learners and their liking of the curriculum through the positive feeling of the material, their excitement, enthusiasm, the exchange of questions and experiences, and the understanding of the learners. The aim of the study is learning, not success.
- 5- Teaching with the five-finger strategy has greatly contributed to the first intermediate students' learning of creative thinking skills.

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

- 1- Continuously working on holding training courses for science teachers, during the service, that deal with active learning topics and strategies.
- 2- Designing science books in a way that is consistent with active learning, according to modern teaching methods in learning and teaching, by giving a space for learners to participate and teach them the skills of creative thinking.
- 3- Providing effective and active teaching requirements, through descriptive teaching methods that help the success of teaching in learning to think according to modern strategies.
- 4- Adopting the five-finger strategy because of its characteristics and a positive impact on increasing the level of achievement and creative thinking

To complement the current research, the researcher proposes to benefit from the (five fingers strategy) in conducting many of the following studies and research:

- 1- Studying the impact of the five-finger strategy in teaching science on dependent variables other than achievement and creative thinking. (Decision making, science processes, scientific tendencies, critical thinking, concept acquisition, reflective thinking ... and others)
- 2- Conducting similar studies at different academic levels.
- 3- Conducting comparative studies between (the five fingers strategy) and other educational models and their impact on achievement and creative thinking.

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