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The Effect Of The Strategy (Form-Share-Liste-Innovate) Strategy In The Logical Thinking Of The Fifth Grade Female Students In Science

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Research Summary

The current research aims to find out (the effect of the strategy of being - share - listen - innovate on the fifth graders in science and logical thinking for them).

The research community was represented by all the fifth grade primary school girls in schools in the district of Kutha, which belongs to the Directorate of Education of Babylon for the academic year (2021-2022). A-C) as a sample for the research to represent (A) the experimental group that studied according to the strategy of being - share - listen - create), which included (30) female students and (C) the control group that studied according to the usual method, which included (30) female students as well) and a test Logical thinking of (12 items) of the multiple choice type (four-alternatives), and the validity of the apparent and constructivist (paragraph discrimination) were checked and its stability was verified by the method of internal consistency (Q-Dor Richardson equation, 20), where the reliability coefficient reached 0 (83, 0)

The results showed that the students of the experimental group outperformed the students of the control group, with a large effect size

Chapter One: Introduction to Research

First: the research problem

In light of the technological and scientific progress, education must prepare tools and methods that keep pace with this scientific and technological development. One of the best of these methods and tools is the curriculum, which is a set of scientific, cultural and social experiences that organize the school and prepare it for the learner to teach him inside and outside the school and lead him to acquire desirable behavior by practicing it. For all the activities and experiences that help him in his full growth (Al-Hashemi and Attia, 2008: 65).

Many studies, such as (Al-Qadri 2002), (Laibi 2011) and (Ali 2015) indicated that there is an urgent need to develop thinking in general and logical thinking in particular through educational programs and innovations such as educational models and strategies, as well as the presence of shortcomings in the methods of modern teaching methods that It cannot be used by most teachers because it is modern strategies that require a lot of material, moral and spatial capabilities.

This indicates that teachers follow traditional methods in teaching science and a weakness in the use of modern teaching methods, including the (con-share-listen-create) strategy, which the researcher will address in her current research, which may contribute to the advancement of logical thinking by answering the following question:

What is the effect of the (formulate-share-listen-create) strategy on the fifth grade girls of primary school science and their logical thinking

Second, the importance of research

The world is now witnessing scientific and technological progress that is increasing in speed. What scientific progress has achieved since the dawn of civilization has led to an increase in looking to the future and planning for it and the need for it in schools in order to keep pace and plan for a better future (Al-Nawaisah: 2013: 26).

The opinions of experts and those interested in teaching sciences are summed up in the fact that scientific education aims mainly to enlighten the members of society and raise their culture by providing them with experiences and skills that lead to their reflection on their behavior and behavior in the face of the scientific issue facing them in their lives (Al-Huwaidi 2005: 49). The process of thinking in science is one of the importance of education and is necessary in all science subjects, which leads to enriching the learner's knowledge and facing difficult life, which requires bringing knowledge related to situations in order to reach the appropriate solution. Therefore, the main goal in teaching science is not to indoctrinate female students with a large amount of Not only information, but employing knowledge and experience, through activating and practicing the processes that lead to the interpretation of phenomena and thus raising the level and performance of the student to be part of her behavior, and this is very weak in the educational institution (Al-Shara et al., 2016: 26). Logical thinking is a mental process that does not depend on an individual's opinion or vision, but rather depends on a series of logical conclusions, and it must be in a culturally objective manner (Al-Afon and Abdel-Saheb 2012: 95).

The importance of the research is reflected in the following points:

- The importance of the co-share-listen-create strategy because it is a modern strategy in raising the scientific level of female students.
- Educators, specialists and experts in curriculum development may encourage the use of logical thinking among primary school students.

Third / Research Objective and its Hypotheses:

The current research aims to identify the effect of the (con-share-listen-create) strategy on the fifth grade girls in science and their logical thinking.

There are no statistically significant differences at the level (0.05) between the average scores of (the experimental group students who studied according to the (con-share-listen-create) strategy and the average scores of the control group students who studied according to the usual method) in the logical thinking test.

Fourth / Research Limits:

The current research is limited to:

- **Human Borders:** Fifth grade girls in primary schools affiliated with the Directorate of Education of Babel Governorate, Kutha District.
- **Spatial boundaries:** Zalfi Primary School for Girls in the Kutha District Center, which belongs to the General Directorate of Education in Babil Governorate.
- **Time limits:** the first semester of the year (2021-2022) morning study.Fifthly, define terms- The strategy (Create Share - Listen - Create) defined by:

Fifthly, define terms

- The strategy (Create - Share - Listen - Create) defined by:

(Madkour, 1991) "It is one of the active learning strategies that lead to diversification of learning and depends on stimulating learners to think separately, and then each group participates in discussing their ideas by asking the question that requires students to think and give them an opportunity to think at different levels" (Madkour 1991: 72).).

Procedural definition:

They are organized and coordinated steps according to the strategy (form-share-listen-create) adopted by the researcher in teaching science to fifth-grade students (experimental group) with the help of the students in raising their academic achievement and their logical thinking.

Logical thinking: defined by:(Abu Jalala, 2007) It is thinking that can derive correct conclusions from premises that are based on the rules of logic, that is, it is correct mental

operations that end with the discovery of facts, (Abu Jalala 2007: 19).

Procedural definition: The use of logical reasoning rules in solving problems represented by the degree that the learner obtains when responding to the logical reasoning test prepared for the purposes of the current research.

Chapter Two: Theory background and previous studies

Strategy (formulate- Share - Listen – create)

is one of the active learning strategies where Johnson and Samith worked to develop (Johnson Gsmith 1991). During teaching, it is the best way to attract the learners' attention through dialogue and discussion with the teacher

Through this strategy, the learner can practice self-criticism, where he can criticize his answer through a discussion with his peers, and he can reach the best answer. 2006, 336).

This strategy is a set of coordinated learning steps and procedures to stop the "con-share-listen-create" strategy, which requires the student to answer and share questions, then listen to the students' answers to find out the answers, then suggest and invent a new answer with her colleagues.

Strategic steps (form -share-listen-create)

First step: (formulate)

Dividing the learners into groups, and each group has a manager who manages the answer and is responsible for the answer that is issued by the group, where their opinions and what they have come up with ideas and answers to the question or problem are discussed in the process of generating new ideas and formulating them in a style, by recalling previous information and experiences and building new knowledge.

The second step: Participation (Share)

In this step, learners present their solutions and answers to their colleagues, where all learners see the same concepts, experiences, and information, but in many different ways.

Step Three: (listen)

In this step, the learners are required to listen carefully to each post as it is presented, analyze and interpret answers and solve problems.

Fourth step: (Create)

In this step, the learners are required to present new ideas through analysis, reflection, interpretation and deep thinking of the material they are studying, and based on previous steps of sharing and listening, the analysis is good. Madkour, 1991: 76).

Strategic Advantages (firmulate - Share - Listen - Create)

- This strategy is easy to implement and quick to implement in the classroom, and its steps are consistent and simple, and it is appropriate for different categories of learners.
- This strategy works to spread the spirit of competition and perseverance among the learners
- This strategy is an active process in which the learner participates himself, discovers knowledge, develops solutions to problems, adjusts his knowledge environment in the light of his previous experiences, and increases the thinking skills of learners.
- This strategy has abandoned the old traditional education and replaced it with modern education in which the learner is active, positive and involved in the educational process.
- It suits the conditions and capabilities in our schools, as it can be used with a large number of students, and it can achieve most of the objectives of the subject

It helps learners to gain information and experiences and access them on their own. It also enables them to be able to analyze and interpret and reach a deeper and more understanding of the topic of the lesson, as well as through which ideas can be discussed. All learners together. (Ramadan: 64, 2008)

The concept of logical thinking:

Logical thinking is one of the most common ideas in our time due to the presence of an increase in problems that require solutions and because a person always needs to think about

all stages of his life to run his life affairs, educational institutions and educational bodies are responsible for providing it and empowering learners from it, developing it and using the means And modern methods for acquiring them to think in an accurate and distinct manner (Atia 2009: 178). Logical thinking is complex thinking, as it combines cause and effect, mental activity and logic, meaning that the learner can obtain evidence that confirms the validity or negation of any idea or point of view, so that the learner is able to follow and apply logical information that leads him to creativity and innovation (Delphi 2014: 133).

The steps of the logical thinking process

- Feeling the problem and then the need to think to reach a solution
- Recalling previous information and experiences to benefit from them in solving this problem
- Generating other ideas to identify the extent to which they are useful to achieve goals and reach a result
- Choosing and choosing the most appropriate solutions to ensure their validity (Tafesh 2004: 71).

Features of logical thinking

- Logical thinking searches for the cause and the cause that created obstacles to something happening
- The cultures acquired by the learner have a great influence on logical thinking (Hussain, 2012: 215).
- Logical thinking grows and develops gradually with the child from birth to other, more advanced stages

Conditions of logical thinking:

The practice of logical thinking requires a number of conditions, the most important of which are:

- The ability to induction, conclusion and good scientific thinking that requires a high level of thinking in determining the meaning in the light of theories and properties and in light of the previous data.
- The ability to observe and relate models in real life situations and the abstract image
- The ability of the thinker to link between inference, relationships, and justification (proof).

Theories that explain logical thinking

- **The theory of cognitive advancement by Jean Piaget:** Jean Piaget was born in Switzerland in the city of Neuchâtel in 1896 AD. He was a curious who published his books at an early age and worked in the laboratory of the National Historical Museum in Switzerland. In the consistency, harmony and linking of ideas and opinions with each other, as well as the compatibility of the individual with his environment (Ghubari 2009: 81).
- **Jerome Brunner's Perceptual Formation Theory:** He was born in 1950 in America in New York. He is one of the well-known psychologists who focused on the environment in learning and on previous experiences and information as an entry point for the development and development of thinking. Bronze relied in his theory on the structure in which the child receives experience and he called it cognitive representations. Bronze assumed that children are different in their representation and the environment is the factor. The main factor that makes these differences is where the basic factors in the environment are through which children can develop kinetic and practical representations, or some of them stand at the iconic representations, (Al-Alwan, 2009, 138).

A study dealing with the strategy (formulate-share-listen-innovate)

Ramadan 2008	Study
The effectiveness of the strategy (formulate-share-listen-create) in developing some higher-order thinking skills and scientific concepts in the study of science	Aim
90	Sample

Higher-order thinking skills test	Tool
T test	Statistical means
The experimental group that was taught according to the strategy of co-share-listen outperformed the control group in the post-test of science subject	Results

A study on logical thinking

Ali (2015)	Study
Preparing a program for the development of logical thinking processes and the kindergarten child	Aim
60	Sample
The scale of logical thinking processes and the program for training children on logical thinking processes	Tool
Pearson correlation coefficient and t-test for two independent samples	Statistical means
Results The children of the experimental group outperformed the children of the control group in the logical thinking processes in the post test	Results

Chapter Three: Research Methodology and Procedures

Research Methodology:

The experimental method was adopted as it is the most appropriate method for the current research procedures and verification of its objectives.

(Wolfolk, 2015) stresses that the experimental method is one of the most accurate research that can affect the causal relationship between the independent variable and the dependent variable in the experiment. Which was controlled except for the variable that the researcher is interested in studying (Wolfolk, 2015: 87).

Search procedures

First / Experimental Design

Experimental design "a scheme determined by the researcher before conducting the experiment in an accurate scientific way so that he can prepare and apply his research procedures after controlling the influencing factors, to collect data and information related to research variables and then reach real scientific results in preparation for their presentation and interpretation" (Aziz, 2019: 77).

Table (4) The experimental design in the current research

dependent variable	independent variable	parity	the two groups
Collection - Logical - thinking	**Strategy (formulate, Share, Listen, Create)**	**Previous collection - Intelligence - Previous information - Logical thinking -**	**Experimental**

Second: The research community and its sample

Research community: the research community is the features of all the phenomenon, or the

characteristic or variable of the phenomenon to be studied within certain limits, and these vocabulary may be individuals, data, curricula and courses, means, methods, or educational systems and the like (Aziz, 2019: 104).

The research sample:

The research sample is a subset of the study population that is selected in an appropriate manner, the study is conducted on it and then those results are used, and circulated to the entire study community, so the research sample should retain all its original characteristics in order to be representative of that community (Al-Tamimi, 2021: 53).

Third: - Equalization of the two research groups

Although the students of the two groups are from the same school, of similar ages and of a close social level, the researcher decided to control the variables that would interfere in their impact with the independent variable in the dependent variable and logical thinking.

Table (7) The arithmetic mean, standard deviation and T-value of the experimental and control group students in the previous information test

The meaning of the difference	Freedom degree	Indication level	T value		standard deviation	SMA	Number	Group
			Tabular	Calculated				
Not statistically significant	58	0,05	2	0,340	1,832	12,233	30	Experimental
					2,171	12,100	30	Adjuster

Fifth: - Research requirements

The researcher prepared the necessary requirements for conducting and applying the research experiment, which are:

Determine the scientific material

Before starting the application of the experiment, the scientific subject was determined, as it included topics that are taught within the annual plan for the content of science subject during the first semester of the academic year (2021-2022 AD) for the fifth grade of primary school, first edition, for the year 2017.

Formulating behavioral goals

Behavioral objectives are statements that accurately describe desired learning outcomes or express specific behavioral changes that we expect the student to acquire after completing the lesson (Al-Shujairi and Al-Zuhairi, 2022: 231).

Number of teaching plans

The planning process makes the educational process expand roles according to specific, organized, interconnected and free steps, achieve partial goals and avoid many emergency situations. The teacher draws and identifies the best appropriate procedures for implementing and evaluating lessons, and links the student's previous information with his daily life (Al-Saadi, 2020: 53).

search tool:

Logical thinking test

The test items were formulated by:

- Defining and defining the skills included in the test, and reviewing the available tests that dealt with logical thinking, such as the study of Tobin & Capie, 1982, (Khair Allah, 2001), Al-Qadri, 2002 and (Laibi, 2011). .
- An interview with a group of experts in educational and psychological sciences and methods of teaching science for the purpose of identifying the logical thinking skills that can be identified among the fifth grade girls.

The exploratory application of the logical thinking test was in two stages:

- **The first exploratory experience**

The test was applied to the first exploratory sample for the purpose of ensuring the clarity of the test paragraphs and answer instructions and calculating the answer time. The answer time by calculating the average range of time between (the time of completion of answering the test items for the first three students and the last three of them). (35) minutes It was found that all the test paragraphs are clear and understandable in terms of meaning and wording.

- **Second exploratory experiment**

The researcher applied the test to a second exploratory sample consisting of (120) female students from the fifth grade of primary school from (Al-Naha, Al-Razi and Jericho) primary schools for girls belonging to the Babel Education Directorate, annex (13) after agreement with the science teacher in the mentioned schools, and after correcting the answers arranged The grades are in descending order, for the purpose of statistical analysis of the paragraphs, then the highest (27%) of the female students' answers were taken to represent the upper group and the lowest (27%) of the female students' answers, and thus the number of students of the upper group (32) and the lower group (32), and the answers of the upper and lower groups were analyzed. Statistically to find the psychometric properties of the test.

Statistical means:

The researcher used the following statistical methods through the statistical package SPSS version 26

Chapter Four: Presentation and interpretation of the results

The arithmetic mean, standard deviation and t-value of the students of the experimental and control groups

logical reasoning test

The meaning of the difference	Freedom level	indicative level	T value		standard deviation	SMA	Number	Group
			Tabular	Calculated				
Statistically significant in favor of the experimental group	58	0,05	2	6.731	1.186	9.200	30	Experimental

In order to calculate the size of the effect of the strategy (Create, Share, Listen, Create) in the logical thinking of the students of the experimental and control groups, the researcher calculated the Eta square (h2) to find out the effect size 0.

Table (23) the value of (t) and ($\eta^{2)}$ and the size of the effect on logical thinking

Size effect	The value of the effect size	Calculated t value	Tabular t value
Big	0.438	6.731	2

Interpretation of results:

Interpretation of the results of the second null hypothesis:

The results of the research showed that there were statistically significant differences between the average scores of the experimental group that studied with the strategy (Construct, Share, Listen, Create) and the control group that studied in the usual way in logical thinking, and the superiority in the average scores was in favor of the experimental group, and their cooperation in arriving at the answer When teaching and using logical thinking, the largest number of students' senses are involved in receiving information, and this in turn helps them to understand and absorb the scientific material that was presented to them, making the retention of information or experience for a longer period in their minds, in addition to that logical thinking makes students have an increased ability To think in general and logical in particular.

Conclusions: Teaching with the strategy of (Connect, Share, Listen, Create) has a positive effect on improving the level of logical skills for fifth grade female students.

Recommendations

- Organizing development courses for primary school teachers to provide them with all new educational strategies to ensure raising the scientific level of primary school students, especially the strategy (Be, Share, Listen, Create).
- The necessity of including the strategy of (Connect, Share, Listen, Create) in teaching methods and curricula in faculties of education, basic education and teacher preparation programmes.

Suggestions:

In light of the results of the current research, the researcher suggests conducting the following studies:

- The effect of Adelson's model on the achievement of science and representational reasoning for fifth graders of primary school.
- The effect of experimental learning methods for (Kolb) on the achievement of physics and spatial intelligence among middle school students.

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