Scholar's Digest- Journal of Multidisciplinary Studies
Volume 3, Issue 7, July - 2024
ISSN (E): 2949-8856
Scholarsdigest.org

THE IMPACT OF CONTRACT LEARNING STRATEGY ON DEVELOPING MATHEMATICAL THINKING SKILLS IN MATHEMATICS SUBJECT FOR MIDDLE SCHOOL STUDENTS

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Abstract
This research aims to understand the impact of using the contract learning strategy on developing mathematical thinking skills among middle school students. The research provides an overview of the contract learning strategy and how to apply it in the context of teaching mathematics.
The research emphasizes the importance of developing mathematical thinking skills among middle school students, as these skills are essential for achieving deep understanding and solving problems effectively in mathematics and in general life. The research presents the contract learning strategy as an effective tool to achieve this goal, as it encourages students to actively participate in the learning process and develop their mental and strategic skills.
The research discusses previous studies and practical experiments showing the impact of the contract learning strategy on improving students' mathematical thinking skills, including critical thinking ability, problem analysis, mathematical reasoning, and deeper understanding of mathematical concepts.
The research concludes with guidelines for teachers on how to implement the contract learning strategy in teaching mathematics to middle school students, emphasizing the importance of providing an educational environment that encourages critical thinking and collaboration among students in solving mathematical problems.

Keywords: Impact, Contract Learning Strategy, Mathematical Thinking Skills, Mathematics, Middle School Students.

Introduction

Research problem

“This study deals with analyzing the impact of the contract learning strategy on developing mathematical thinking skills among middle school students in mathematics. The research aims to understand the way in which the contract learning strategy affects the development of mathematical thinking skills, which are essential for improving students’ performance in mathematics. It will be implemented The study is an applied study, where the contract learning strategy will be applied to a group of students in a middle school, compared to a traditional learning group. The extracted data will be analyzed to provide clear results about the effect of this strategy on developing students’ mathematical thinking skills in mathematics, which may

contribute to. Developing effective educational practices in this field, and from here the research problem arises in the following question: What is the effect of the contract learning strategy in developing mathematical thinking skills in mathematics for middle school students?

Research Importance

"The importance of this research comes from the necessity of developing mathematical thinking skills among middle school students, as these skills are essential for understanding mathematical concepts deeply and applying them effectively. Despite the existence of many educational strategies, the contract learning strategy emerges as a potential option to achieve this goal, given the interaction Direct students with educational materials and the teacher, which enhances critical and creative thinking. Therefore, it is important to conduct this study to understand the impact of this strategy on improving students' performance in mathematics, which can contribute to developing educational practices and improving learning outcomes in this area."

Research Objective

The current research aims to identify the effect of the contract learning strategy in developing mathematical thinking skills in mathematics for middle school students.

search limits

Objective limits: The effect of contract learning strategy in developing mathematical thinking skills in mathematics for middle school students.

Spatial boundaries: Iraq - Baghdad.

Time limits: The research was conducted and implemented in the academic year 2024 AD.

Define terms

1. Impact

A. language"The rest of the thing and the plural are traces and traces, and they came out in its wake, that is, after it. I affected it, affected it, and followed its trace. And trace: by moving what remains of the drawing of the thing, and influence is keeping the trace in the thing, and affected in the thing, leaving a trace in it." (Ibn Manzur, 2004) , Volume 1, Article, ATH R:6).

B. Terminologically: Defined as:

1) "It is the result, it is the sign that results from the thing, and it is the characteristic that indicates the thing" (Al-Shammari, 2002:28).

2) Al-Saqqaf (2007): "It is what the learner sees in terms of features, imprints, changes, or effects in the thing that affects him. There is an influencer and an influencing person in the sense of an independent variable that affects a dependent variable (Al-Saqqaf, 2007: 19).

2. Contract learning strategy

It is an educational approach based on the principle of mutual interaction between the teacher and students, where both parties agree on the learning goals and the means used to achieve them. (Abu Al-Haj, 2016, p. 34)

This strategy is continuous interaction between the teacher and students to jointly determine learning goals and the means to achieve them. Objectives, plans and resources are negotiated, enhancing student engagement in the learning process. (Saeedi, 2016, p. 111)

This strategy involves encouraging the teacher and students to cooperate in setting educational goals and determining plans to achieve them. This is done through open conversations and continuous interaction between the two parties. (Al-Hallaq, 2010, p. 143)

Students and the teacher exchange responsibilities in the learning process, allowing students to contribute in identifying the topics they want to study and determining the learning methods that are appropriate for them.. (Hanoun, 2015, p. 154)

Mathematical thinking skills

It is the set of abilities and skills that an individual possesses in understanding and solving mathematical problems in a logical and organized manner, which includes the ability to analyze deeply, draw correct conclusions, use imagination and creativity to find solutions, and use mathematical methods and techniques effectively. (Allawi, 2000, p. 43)

It refers to the set of intellectual skills that an individual possesses that help him understand and apply mathematical concepts correctly and effectively, which includes the ability to deduce, analyze, and think critically.. (Al-Maliki, 2010, p. 13)

It means the set of skills and abilities that an individual needs to solve mathematical problems in an effective and logical manner, and includes the ability to think systematically and use mathematical processes correctly.. (Al-Mashhadani, 2000, p. 34)

It is the ability to use creativity and imagination to develop new and effective solutions to mathematical problems, which requires thinking creatively and developing new methods and ideas in solving mathematical problems..

(Al-Huwaidi, 2005, p. 143)

Chapter Two: A theoretical framework and previous studies

First: The theoretical framework

Contract learning strategy

Contract learning strategy is an educational method that focuses on motivating students to actively participate in the learning process by making agreements or agreements with the teacher. This strategy relies on continuous interaction between the teacher and students where goals and responsibilities are jointly defined between them. This includes setting specific, measurable goals, identifying appropriate means and strategies to achieve these goals, in addition to continuously evaluating progress and adjusting plans as needed.(Al-Jubouri and Al-Janabi, 2012, p. 20)

Contract learning is characterized by activating students' role in the decision-making process and taking responsibility for their educational progress, which enhances interaction, participation, and integration into the learning process. This strategy can contribute to

enhancing critical and creative thinking skills, enhancing interaction between students, and enhancing their deep understanding of mathematical concepts. (According to the Prophet, 2010, p. 154)

The concept of contract learning strategy

Contract learning strategy is an advanced educational approach that involves encouraging students to actively participate in the learning process by jointly setting goals and responsibilities between them and the teacher. The importance of this strategy is to enhance the interaction and effective participation of students in the learning process, which enhances their critical and creative thinking and contributes to deepening their understanding of educational materials. This approach allows students to take self-responsibility for their learning, thus contributing to improved learning outcomes and more effective achievement of learning objectives(Shehata, 2008, p. 416)

Stages of contract learning strategy

The contract learning strategy includes several stages that the teacher and students follow to achieve educational goals effectively. These stages include:

1. **Setting common goals:**In this stage, the teacher and students meet to determine the learning goals they want to achieve together.
2. **Make a conscious plan:**The steps necessary to achieve specific goals are determined based on the individual needs and skills of students, with appropriate instructional strategies identified.
3. **Implement the plan:**Students work collaboratively with the teacher to implement the specified plan and apply instructional strategies to achieve educational goals.
4. **Evaluate progress:**Progress is regularly evaluated against set goals, and results are analyzed to identify areas that need improvement or modification.
5. **Review the agreement:**The agreement between the teacher and students is periodically reviewed to ensure continuity of interaction and effective achievement of educational objectives.

These stages help guide the contract learning process in a consistent and organized manner, which enhances the effectiveness of this strategy in achieving satisfactory learning results for students. (Dahshan, 2009, p. 146)

The role of the teacher in the contract learning strategy

The role of the teacher in the contract learning strategy is essential and vital to ensuring the success of the educational process and achieving the specified educational goals. The teacher's role in this strategy includes several key aspects, including:(Jawabra, 2016, p. 114)

1. The teacher encourages active interaction between students and himself, which includes asking stimulating questions and directing educational discussions to stimulate deep understanding and promote engagement..
2. The teacher sets shared learning goals jointly with students, promoting engagement and motivation to achieve these goals.

3. The teacher plays a directive role in directing the learning process and providing support and guidance to students in using appropriate educational strategies to achieve goals.
4. The teacher provides appropriate feedback to students periodically, which helps them understand the extent to which they have achieved educational objectives and identify areas that need improvement..
5. The teacher reinforces the role of students in taking self-responsibility for their learning process, encouraging them to be independent, critically thinking, and innovative.

In short, the teacher in the learning strategy contracts the role of a leader and mentor, helping students achieve educational success by guiding, supporting and motivating them to participate effectively in the learning process.

The role of the learner in the contract learning strategy

In the contract learning strategy, the learner plays an active and vital role in the learning process, taking responsibility for a large part of the process of setting goals and implementing educational plans. Here are some of the most important learner roles in this strategy:(According to the Prophet, 2010, p. 22)

1. The learner participates in setting educational objectives in cooperation with the teacher. The learner identifies what he or she wants to achieve through study, making the goals more targeted and tailored to his or her personal needs.
2. The learner participates in developing educational plans and strategies that will help him achieve the set goals. The learner interacts with the teacher to identify effective methods that can be used to achieve learning.
3. The learner actively participates in implementing educational plans, and uses specific strategies to achieve educational goals. The learner cooperates with the teacher and focuses his effort on applying the required concepts and skills.
4. The learner participates in the process of evaluating progress and analyzing results. The learner evaluates the extent to which educational objectives have been achieved and identifies areas that need development or improvement.
5. The learner participates in the process of continuous review and evaluation, providing feedback on how the learning objectives are being achieved and whether current strategies are effective or not.

Mathematical thinking skills

Mathematical thinking skills include a set of vital abilities that individuals use to analyze and understand mathematical concepts and solve related problems. These skills include the ability to logically analyze and reason accurately, the ability to imagine and be creative in finding new solutions, in addition to the ability to organize, arrange, and effectively communicate mathematical ideas. Mathematical thinking skills are essential for understanding mathematics in depth and applying it effectively in solving everyday problems and in various areas of life. Developing these skills contributes to improving individuals' athletic performance and enhances their ability to think critically and innovate in multiple fields (Shahin, 2011, p. 134).

The concept of mathematical thinking skills

Mathematical thinking skills represent a set of vital skills that individuals use to solve mathematical problems and think critically in the context of mathematics. These skills include the ability to analyze information critically and logically, understand mathematical relationships between ideas and concepts, as well as the ability to think in innovative and creative ways to solve mathematical problems. It also includes the ability to extract results and conclusions from available data, and generalize them for broader applications, in addition to organizing ideas and information well and expressing them clearly and concisely. Developing mathematical thinking skills is essential in learning mathematics and in individuals' lives in general, as these skills help improve the ability to think critically and logically, and solve problems effectively in various fields..
(Shehata, 2012, p. 145)

Patterns of mathematical thinking skills

There are several types of mathematical thinking skills, and they can be classified as follows(Awad, 2010, p. 145)

1. AnalyticalThese skills include the ability to analyze mathematical problems into their basic components, and understand the relationships between different ideas and concepts. This includes the ability to logically analyze evidence and data and provide appropriate solutions.
2. CreativeThese skills are the ability to think in new and innovative ways to solve mathematical problems. This includes the ability to use imagination and creativity to discover unique and unconventional solutions.
3. CommunicativeThese skills relate to the ability to communicate and exchange mathematical ideas clearly and concisely. This includes the ability to guide arguments logically and present mathematical explanations in an effective manner.
4. DeductiveThese skills include the ability to infer conclusions and observations from available data and identify existing laws or patterns. This includes the ability to extract key ideas and generalize them for wider applications.
5. ArithmeticThese skills relate to the ability to use arithmetic and mathematical operations effectively in solving mathematical problems and analyzing data.

These styles overlap with each other and work together to enable the individual to think broadly and comprehensively to solve mathematical problems effectively. Developing and developing these skills contributes to improving individuals' performance in mathematics subjects and in their general lives.

Developing mathematical thinking skills

Many studies have addressed the topic of developing mathematical thinking, such as Al-Attal (2012), Hamada (2009), and Al-Tourdi (2003). A study by Afaneh et al. (2007) indicated that there are a set of proposals for the teacher's role in developing mathematical thinking skills that must be taken into consideration, including::

- Focus on understanding concepts before skills; Correct understanding of concepts enhances learners' performance in practical application.

- Avoid routine in training; Instead, provide diverse exercises that encourage creative thinking and take into account individual differences.
- Promote original thinking; By encouraging learners to think creatively and invent new and different solutions.
- Distribute training at regular and appropriate intervals, without misusing time.
- Avoid punitive approaches to teaching, and use positivity and motivation to encourage learners.

Abu Zeina and Ababneh (2007) point out that the teacher can support the processes of integration and conceptual awareness by motivating learners to carry out certain mental processes, such as organizing knowledge and formulating conclusions.

Mathematics is considered a scientific method and a means of technological development, as it is characterized by accuracy, clarity and conciseness. It is important that it be taught effectively to help develop learners' skills, through the use of appropriate teaching methods, as Al-Azab (2018) explained. The mathematics teacher must choose teaching strategies that contribute to enriching the learner's knowledge and developing his intellectual skills.

The teacher must be aware of the importance of these strategies in education, and use appropriate methods and techniques to motivate learners and enhance their activity within the classroom. The teacher must also take learners' ideas into account and present activities in a way that encourages creativity and problem solving, while providing opportunities to listen to their opinions and address them constructively.

Teaching mathematical thinking skills

Teaching mathematical thinking skills It is done as follows: (Ibrahim: 2009, 28-25) The teacher uses the methodology of asking students questions that help them think about the solution on a correct basis, so he asks himself models of questions, such as: Where do I start? What should I do? What are the educational outcomes of the teaching methods that I follow? The answer to the first question determines the starting and starting point in the thinking process, the answer to the second question determines the plan that is followed in thinking, and the answer to the third question determines the evaluation methods that must be applied to know the results of thinking in relation to solutions to issues and problems. The methods include questions: comparative, relational, explanatory, inductive and deductive. ... -The teacher uses various teaching strategies, such as using the induction strategy when the teaching situation requires arriving at generalizations (rule - theory - law), or using the analogy strategy to think about special cases (solving problems and exercises). What is important here is that the strategy used is appropriate. For the student's developmental stage, so that he can understand and realize what the teacher is saying. -The teacher should provide appropriate opportunities for the student to describe the steps he has taken, which express the paths of his mathematical thinking, and thus the teacher can trace these paths and correct them whenever the educational situation calls for it. - That the words and expressions used in the teaching situation be related to thinking skills and processes, that they suit the learner's linguistic vocabulary, that they arouse the learner's latent motivations, and that they express the teacher's normal, polite personality. The evaluation methods applied by the teacher should

pay attention to the thinking processes carried out by the learner, and sometimes challenge them a little to reach the first level of higher thinking processes (metacognitive thinking). - The teacher provides appropriate opportunities through which he can measure the student's ability to interact with other colleagues and with new teaching situations. The researcher has defined mathematical thinking skills in this research as follows (induction, deduction, expression with symbols, formal logic, mathematical proof) (Muhammad Ali, 2017, p. 87)

Second: Previous studies

Abbas Fadel Kazem, 2021, The effect of contract learning strategies and educational stations on the deductive thinking skills of sixth grade biological science students in chemistry.

The research aimed to know the effect of teaching using contract learning strategies and educational stations on the inferential thinking skills of sixth grade scientific/biological students in chemistry in the Aziziyah district. The research sample was chosen intentionally and the number of its members reached (113) students in the sixth scientific/biological grade of middle school. Al-Azizia Boys School, affiliated with the Al-Azizia Education Directorate, and random assignment was divided into three groups: two experimental groups that taught using contract learning strategies and educational stations, and the other a control group that taught in the traditional method, and taught the groups with the same academic content. The study took a period of (10) weeks, and a deductive thinking test was used. The validity and reliability of which was confirmed, and the results showed that there were statistically significant differences in deductive thinking in favor of the first and second experimental group, whose students were taught using contract learning strategies and educational stations. In light of the research results, the researcher recommended several recommendations and proposals, the most prominent of which are: preparing a training program for chemistry teachers. According to the use of contract learning and stations strategies in teaching chemistry, as well as conducting similar studies for different educational levels.

Dalal Fadel Idris, 2023, The effect of the contract learning strategy in developing complex thinking among second-year intermediate female students in social studies.

The goal of the research is to identify (the effect of the contract learning strategy in developing complex thinking among second-year intermediate school students in social studies). To achieve the goal of the research, the two researchers formulated the following null hypothesis: - There is no statistically significant difference at the significance level (0.05) between the average grades of female students. The experimental group who studied social studies using the contract learning strategy and the average grades of the students of the control group who studied the same subject in the usual way in the complex thinking test. The researcher chose an experimental design with partial control for two equal groups, and she randomly selected a sample of female students in the second intermediate grade in Ruqayyah Girls' Middle School and Palestine Girls' Middle School. Affiliated to the Nineveh Governorate Center for the academic year (2022-2023), first semester. The size of the research sample was (60) female students distributed into two groups. The first represented the experimental group and

the number of its members was (30) female students who studied according to the contract learning strategy. The second group represented the control group that studied in the usual way and the number of its members was (30) female students. The researcher was rewarded statistically between The students of both groups in a number of variables, namely (the chronological age of the students, previous achievement in social studies, intelligence, and the academic achievement of the mothers and fathers). The researcher prepared a complex thinking test, and its final form consists of (20) items for two dimensions of complex thinking: (critical thinking and creative thinking) The validity of the test and the coefficient of discrimination of the test were calculated. As for the reliability of the test, it was calculated using the Cord Richardson method, reaching (0.88), which is a high reliability coefficient. The scientific material was specified in the first two semesters (first and second), and the teaching objectives were formulated according to Bloom's classification for the six levels (Remembering - understanding - application - analysis) where the number of goals reached (50) behavioral goals. The researcher prepared teaching plans for the topics to be taught in the social studies (geography) subject, and the experiment began from Tuesday, corresponding to (11/1/2022) until Wednesday, corresponding to (1/4/2023), and after analyzing the results statistically using (spss) The results showed that the female students of the experimental group who studied according to the contract learning strategy outperformed the female students of the control group who studied using the usual method in the complex thinking test, and in light of this, the researcher presented a set of recommendations and proposals.

Chapter Three: Research methodology and procedures

Since this research sought to find out (the effect of the contract learning strategy on developing mathematical thinking skills in mathematics for middle school students), the experimental approach is the most appropriate to achieve the objectives of the research, in order to find out the effect of the experimental factor (the independent variable) represented by the contract learning strategy in (Dependent variable) mathematical thinking skills.

This is because the experimental method subjects the factors affecting all the phenomena under study to control. It depends on careful observation of a problem (psychological, social, educational), and based on this observation, it determines the appropriate tool to test the validity of its hypotheses (Dawoud Anwar, 1990, p. 247). This approach includes the following procedures:

- **Search procedures**

First: Experimental design:

Experimental design is of great importance in research and studies because of its effective role in the observations it suggests to the researcher that he should make and the method that he should follow, as well as his suggestion of appropriate statistical tools and the method of analyzing the material he collects, and the results expected to be obtained from the analysis (Al-Zobaie and Muhammad, 1981, p. 128). The researcher adopted the design of a non-randomly selected control group with a pre- and post-test, and Figure (1) shows this.

Figure (1) The experimental design adopted in the research

the test	Dependent variable	Independent variable	the test	the group
after me	Mathematical thinking skills	Contract learning strategy	Tribal	Experimental
		_____		Female officer

Second: The research community and its sample

1- **research community**:

A systematic scientific term that means what the results of the study can be generalized to, whether it is a group of individuals, books, or school buildings, according to the objective field of the research problem. To choose a representative sample of the research community, it is necessary first to identify the original community.

The population of this research consisted of second-grade middle school students in middle school day schools in Baghdad Al-Karkh First Education School.

The research sample:

The researcher intentionally chose the first Baghdad Al-Karkh Education Directorate to select the research sample from it.

Third: Equivalence between the experimental and control groups:

Although the researcher followed random assignment in selecting the two research groups, the researcher was keen, before starting to implement the experiment, to ensure that the two research groups (experimental - control) were equal in the number of variables that previous sources and studies believed might affect the results of the experiment through their interaction with the independent variable. Which negatively affects the dependent variable, and it happenedThe researcher obtained information on some variables (the academic achievement of the fathers and mothers and the chronological age of the students) from two sources: the students' school cards with the help of the school administration, and from the students themselves through an information form distributed by the researcher to them. The following is an explanation of the equivalences in the following variables:

1. Chronological age calculated in months.
2. Language ability test scores.
3. Parents' academic achievement.
4. Mothers' academic achievement.
5. Academic motivation.
6. Creative writing pre-test.

Fourth: Controlling extraneous variables:

Educational literature has shown that the main goal of this process is to control a number of non-experimental variables in experimental studies, especially educational and psychological

ones, to reduce the impact of these variables whose effect on the dependent variable may interfere with the effect of the independent variable, so the researcher tries to isolate their effects from the dependent variable; Because the dependent variable is subject to the influence of several factors other than the independent factor. (Daoud, 1990, p. 259) These variables are:

1- Accompanying accidents:

The symptoms and accidents that may occur during the course of the experiment, as they have an impact on the dependent variables in addition to the impact resulting from the experimental variable (Al-Zobaie and Muhammad, 1981, p. 95), and the experiment was not accompanied by any noteworthy incidents that affect the conduct of the experiment.

2- **Experimental extinction** This means that the experiment was exposed to cases of transfer or interruption of attendance for some of the female students subjected to the experiment, which would affect the results of the research (Al-Zubaie and Muhammad, 1981, p. 98). This experiment was not exposed to cases of abandonment, interruption, or transfer of students in both groups, except for some individual cases of absence. This is a normal condition that is almost equal in the two research groups.

3- **Sample selection method** The researcher resorted to the purposive selection method in determining the two research samples in an effort to limit the effect of the variable in showing these differences, or not, in the research results, in addition to conducting statistical parity between the two groups in a number of variables whose interference with the independent variable could have an impact on the variable. In addition to the homogeneity of the students of the two research groups in social and cultural aspects to a large extent thanks to their belonging to the same environment.

4- **Maturity and related processes** Maturity and all the biological growth processes to which members of the two research groups might be exposed had no effect on the implementation and progress of the experiment.

5- **Statistical regression**:

It is the tendency of extreme scores to move toward the center of the distribution, and this affects the stability of the test. That is, we notice that the subjects obtain very high or very low scores upon the first application of the test, and then their scores decline toward the middle upon the second application of the test. (Al-Azzawi, 2007, p. 70).

6- Measuring tool:

The researcher made every effort to use standardized tools to measure the variables. She prepared an instrument To measure mathematical thinking skills in mathematics, it consisted of two tests, the first for pre- and post-measurement

Fifth: The effect of experimental procedures:

1- Search confidentiality:

The researcher was keen on the confidentiality of the research in agreement with the school administration not to inform the students about the nature and purpose of the research in order to control all changes that might occur to the students' activity or their dealings with the experiment, which might affect the safety of the experiment and its results.

2- Duration of the experiment.

3- Subject:

The study subject was the same for both research groups, and was represented by a number of topics from the mathematics book for the second grade of middle school.

4- Distribution of shares:This factor could be controlled through equal distribution of lessons between the two research groups.

5- School building: The school building, which was Baghdad Middle School for Boys, was complete in terms of technical and scientific aspects and suitable for implementing experimental procedures.

Sixth: Experiment requirements:

A. General goals: (General Goals)

Planning for any specific educational program requires specifying a list of all the general goals and behavioral goals that the program seeks to achieve. General goals are defined as the major, far-reaching, most comprehensive, and most difficult goals, in comparison with the specific goals, covering the three aspects of learning: the cognitive (mental) aspect, and the emotional aspect. (Emotional) and the skillful (psychomotor) aspect, are in the form of statements with no specific time period, and are described as strategic goals linked to general planning or a comprehensive educational philosophy for teaching, and are considered the basis upon which the provisions of the process of evaluating learners' learning are built. (Abu Al-Ezz Salama et al., 2009, pp. 63-64)

B. Behavioral objectives:Behavioral Goals))

The behavioral objective explains the outcome or outcome that we seek for the learner to achieve at the end of a lesson or group of lessons. Whenever the behavioral goal is set clearly and precisely, that is, in a sound manner, it will undoubtedly describe the nature of the return or change in behavior that will occur to the learner.

(Jaber et al., 2005, p. 317).

1- Determine the cognitive content:

Cognitive content expresses the information and knowledge contained in the scientific subject, and is the main tool for achieving the educational goals of any educational institution. It is provided to learners to help them achieve comprehensive growth. Therefore, it was necessary

to organize and coordinate the knowledge content experiences in a way that achieves the desired goals of the proposed program (Al-Heila, 1999, p. 127).)

2- Determine teaching methods, strategies and methods:

Teaching strategies, methods, and techniques are an important element of the proposed program, one of the main pillars of the success of the educational process, and a basis for achieving educational goals. Therefore, it is difficult to separate the objectives of the proposed program and its educational content from the methods and methods used in teaching. (Madkour, 1998, p. 228)

Activities: Activities

Activities are considered one of the most important aspects that enrich and nourish the curriculum. Through them, the teacher is able to invest in the learners' potential and latent talents in a correct and directed manner, and at the same time, the learner finds in them an outlet for his mental, emotional, and technical skills (Younis et al., 2004, pp. 129-131).

It prepares the way for the learner to build the educational material in his mind, acquire diverse experiences, and develop skills in the cognitive, emotional, and skill fields (Al-Tamimi, 2009, pp. 187-188).

Towards achieving the desired goals, the activities are all that the learner participates in inside and outside educational institutions, such as work that requires mental, manual, or practical skills capabilities that provide him with more experiences that support his learning of various topics. The activities are divided into classroom activities, non-curricular activities, and activities and exercises in the program. The educational topics included, the researcher enriched the chosen cognitive content with various activities appropriate to achieving the objectives of the strategy followed.

5- Teaching aids:

It is defined as a group of educational materials that are chosen, developed, or described by the teacher to convey educational content, or access to it, so that it moves the learner from the reality of abstract experience to the reality of concrete experience, and helps in effective learning with less effort and cheaper cost in an interesting atmosphere and desire towards learning. better. (Al-Hila, 1999, p. 222).

6- Calendar methods:

After completing all the previous processes of planning, setting goals, choosing educational content, identifying strategies, teaching-learning experiences, and educational methods that help him achieve the goals, the teacher must determine the method or methods by which everything that he and his students have done is evaluated. In terms of work, evaluation is considered one of the most prominent pillars of planning and implementing the educational program, and in an effort to ensure the percentage of achieving the desired educational program goals, the evaluation must be continuous, comprehensive, and diverse, and thus it falls into types according to its intended purpose.

A. **Preliminary calendar**:It is the evaluation through which it is possible to know the amount of information that the students possess before starting the research, in order for the teacher to ascertain the scientific background of the learners, and this evaluation usually occurs at the beginning of the academic year.

(Aziz and Maryam, 2015, p. 66)

B. **Formative calendar (ongoing)**:This evaluation is conducted during the educational process with feedback to improve teaching and learning as well as to know the level of progress made by learners.

(Omar et al., 2010, p. 24).

C- Summative (final) evaluation: It is the evaluation process that shows the degree to which learners have achieved the main outcomes of learning the course.

Seventh: Research tools: (Search tools)

The nature of this research requires the availability of two tools, the first to measure creative writing skills, and the other to measure the adequacy of silent reading. The following is a statement of the procedures for preparing this tool:

1- Pre-post mathematical thinking skills test:

2-Drafting the test items:

- **Honesty**Honesty is one of the important psychometric properties that must be present in the test (tool), and the researcher extracted two types of honesty:

1- **Virtual validity**:It is that the appearance of the tool measures the content for which it was built, or that the tool is characterized by honesty if its title and appearance indicate the purpose for which it was developed.

(Abdel Majeed, 1999, p. 21)

2- Content veracity:It means the extent to which the scale items match the content, content, or objective of the test; That is, the extent to which the test items represent a sample of behavior that represents the behavior to be measured.

(Abdel Majeed, 1999, p. 22).

Eighth: Implementing the experiment

1-Pre-experiment stage

2- Experiment implementation stage:

Ninth: Statistical methods: The researcher relied on the statistical analysis program**spss**For the humanities and social sciences in analyzing the results of its research.

Chapter Four: Presentation and interpretation of the results

First: Presentation of the results

After the researcher completed the research experiment in accordance with the steps she indicated in the previous chapter, she analyzed the results she reached to find out "the effect of the contract learning strategy in developing mathematical thinking skills in mathematics for middle school students," as well as knowing the significance of the statistical differences between them, and then verifying the Research hypotheses, and revealing whether the research results support these hypotheses or not.

For the purpose of verifying the null hypothesis which states that:

There is no statistically significant difference at the significance level (0.05) between the average scores of the experimental group students who study according to the (contract learning strategy) and the average scores of the control group students who study according to the usual method in testing mathematical thinking skills in mathematics.

After correcting the students' answer sheets, the arithmetic mean and variance were calculated for the two groups, as shown in:Table (2): The average score of the experimental group students was (62.2) with a standard deviation of (5.41), while the average score of the control group students was (58.7) with a standard deviation of (3.28). Using the t-test for two independent samples, it became clear The difference between them was statistically significant at the significance level (0.05), as the calculated T-value was (6.4), which is greater than the tabulated T-value (2).Degrees of freedom (58), and thus the first null hypothesis is rejected, meaning that:

There is a statistically significant difference at the significance level (0.05) between the average scores of the experimental group students who study according to the (contract learning strategy) and the average scores of the control group students who study according to the usual method in testing mathematical thinking skills in mathematics, in favor of the experimental group.

Table (3) The significance of the difference between the average scores of the achievement test for students in the two groups (experimental and control)

The significance atlevel 0.05	T value		Degree of freedom	standard deviation	Arithmetic mean	the sample	the group
Statistically significant	Tabulation	Calculated					
	2	6,4	58	5,41	62.2	30	Experimental
				3,28	58,7	30	Female officer

Second: Interpretation of the results

This holds the student responsible for the forms and patterns of his learning, and making a decision regarding them, with the help of the teacher. This formula is based on negotiation

with the help of the teacher until the student reaches a decision regarding his learning, in which a written contract or document is drawn up that precisely explains the dimensions of the agreement between the teacher and the student, so that both parties adhere to the elements of this agreement during The role is based on educational experience.

This strategy emphasizes compulsivity: the student bears the burden of his learning, and obligates him to achieve the goals he seeks to achieve. This obligation is within a framework of freedom in choosing the materials, means, and method by which he must learn. It is also obligatory for the teacher in terms of the obligation to provide assistance, materials, and means by which he learns. student through it.

Third: Conclusions Based on the above, the researcher can summarize her findings as follows:

- The positive impact of the contract learning strategy is because this strategy aims to achieve learning goals and take into account the student's interest and abilities, taking into account that the student may not have full awareness of the learning sources and their characteristics. This formula allows the student the freedom to change the alternatives he chooses for his learning with flexibility that allows him to achieve the goals. Under the guidance and guidance of the teacher.
- The contribution of the contract learning strategy depends on interactivity: Contract learning must be based on interactive learning activities, which do not depend on the teacher as the sole source of knowledge, but rather are based on the student's activity and interaction with all the learning sources available to him within the classroom.

Fourth: Recommendations: The necessity of using educational models in teaching and teaching mathematics, especially the educational contract learning strategy, the effectiveness of which has been proven through this current research.

Fifth: Proposals: The researcher proposes to complete her study by conducting the following studies:

1- Conduct a study similar to this study on other academic levels in mathematics.

Conducting a study similar to this study with other variables that were not addressed in this study, such as (cognitive beliefs, logical thinking, cognitive exploration)

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