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# **Two Strategies Are Proposed According To Active Education And Their On The Effect On The Acquisition Of Mathematical Concepts For Second Grade Students In Mathematics**

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## **Abstract**

The weakness of students in their acquisition of the concepts of mathematics and their inability to absorb them, as well as their inability to mathematical topics and ways to solve it for many reasons, and may be one of the reasons for weakness is the teaching methods used in mathematics at various stages and the organization of the method, as the teaching material is often provided in a dry and focused manner On memorization and memorization, it seems like an artificial thing has nothing to do with reality, which makes the student feel difficult to learn. Through the modest experience of researchers in the field of teaching mathematics, they noticed that there are difficulties experienced by students in learning mathematics, which reflects negatively on their acquisition of mathematical concepts, and may be one of the reasons is the teaching methods used in which the role of the student receiving information and knowledge only and not involved in The educational process of learning, as evidenced by the questionnaire distributed to (25) mathematics teachers for middle school and from several schools shows that the answer to the first question (Do you adopt modern teaching strategies and methods other than memorization and memorization?) Was 85% of the alternative (k No, as well as the conclusions of several studies, including the study (Janabi, 2018), where the conclusions confirmed that one of the main reasons for poor students' acquisition of mathematical concepts is due to the adoption of traditional teaching methods of mathematics teachers and away from the adoption of strategies and modern methods that may help improve the ability of students In the acquisition of mathematical concepts.

## **Se proponen dos estrategias de acuerdo con la educación activa y su efecto en la adquisición de conceptos matemáticos para estudiantes de segundo grado de matemáticas**

### Resumen

La debilidad de los estudiantes en la adquisición de los conceptos de las matemáticas y su incapacidad para absorberlos, así como su incapacidad para los temas matemáticos y las formas de resolverlo por muchas razones, y puede ser una de las razones de la debilidad son los métodos de enseñanza utilizados en matemáticas en varias etapas y la organización del método, ya que el material didáctico a menudo se proporciona de manera seca y enfocada. En la memorización y la memorización, parece que algo artificial no tiene nada que ver con la realidad, lo que hace que el estudiante se sienta difícil de entender. aprender. A través de la modesta experiencia de los investigadores en el campo de la enseñanza de las matemáticas, notaron que los estudiantes tienen dificultades para aprender las matemáticas, lo que se refleja negativamente en su adquisición de conceptos matemáticos, y puede ser una de las razones por las cuales los métodos de enseñanza utilizados El papel del estudiante que recibe información y conocimiento solamente y no participa en el proceso educativo de aprendizaje, como lo demuestra el cuestionario distribuido a (25) maestros de matemáticas para la escuela intermedia y de varias escuelas muestra que la respuesta a la primera pregunta (¿Usted adoptar estrategias y métodos de enseñanza modernos distintos de la memorización y la memorización?) ¿Era el 85% de la alternativa (k No, así como las conclusiones de varios estudios, incluido el estudio (Janabi, 2018), donde las conclusiones confirmaron que uno de los principales Las razones para la adquisición de conceptos matemáticos por parte de los estudiantes pobres se deben a la adopción de métodos tradicionales de enseñanza de las matemáticas. maestros y lejos de la adopción de estrategias y métodos modernos que pueden ayudar a mejorar la capacidad de los estudiantes en la adquisición de conceptos matemáticos.

### Introduction:

One of these strategies may increase students' ability to understand mathematics relationally. Based on the above, the problem of research can be determined by answering the following question: Do the two proposed strategies have an impact on the acquisition of mathematical concepts

among second graders in mathematics?).

The importance of research: The importance of research includes two aspects of theoretical importance and practical importance:

First, theoretical importance:

1. The results of this research may serve to draw the attention of the authors of school math textbooks by employing two proposed strategies for active learning in the formulation of the content of math textbooks in the intermediate stage and not only limited to abstract knowledge and information.

2. Provide the opportunity for students to learn mathematics in a variety of ways commensurate with their thinking and learning methods as well as their abilities and abilities.

3. At the end of the research will be presented a set of proposals that could benefit researchers in the future in the conduct of other studies to complete the current research process.

Second: Applied Importance:

1. This research calls for linking school mathematics to life, and mathematics with each other and linked to other subjects that may enable the student to build an existing perception of the usefulness of mathematics and the importance of, and thus to form positive attitudes towards learning mathematics.

2. This research can be in line with modern educational trends that include educational activities that correspond to the mental abilities of middle school students.

3. Researchers and teachers can benefit from the test to gain the mathematical concepts that will be built in the research.

Research Objective:

The aim of this research is to investigate the effect of two proposed strategies for active learning on the acquisition of mathematical concepts for second graders in mathematics.

Research hypotheses:

To achieve the research objective, the following zero hypothesis will be formulated:

Zero hypothesis: "There are no statistically significant differences at the significance level (0.05) between the mean scores of students studying according to the proposed concept cell strategy, students studying according to the strategy of the proposed information gap strategy, and students studying according to the usual method of acquiring. Mathematical concepts for second grade students in mathematics.

The following hypotheses are derived:

1. There is no statistically significant difference at the level of significance (05.0) between the average scores of the first experimental group students (who study mathematics according to the proposed concept cell strategy for active learning) and the grades of the control group students (who study mathematics according to the normal methods). Acquisition test of mathematical concepts.
2. There is no statistically significant difference at the level of significance (05.0) between the average scores of the second experimental group students (who study mathematics according to the information gap strategy proposed for active education) and the grades of the control group students (who study mathematics according to the normal methods). In the test of acquiring mathematical concepts.
3. There is no statistically significant difference at the level of significance (05.0) between the average scores of the first experimental group students (who study mathematics according to the proposed concept cell strategy for active learning) and the grades of the second experimental group students (who study mathematics according to the information gap strategy. Proposed for active learning) in the test of acquiring mathematical concepts.

search limits:

1. Second grade intermediate students from intermediate and secondary government schools of the Directorate General of Education Baghdad / Rusafa III.
2. The first semester of the academic year (2018-2019).
3. The research is determined by two proposed strategies (the concept cell strategy and the information gap strategy).

Define terms:

Active Learning

- (Lakani and Ali, 2003): "That learning, in which the learner is actively involved in the learning process through reading, research and access and participation in the classroom and extra-curricular activities and where the teacher guided and guided the learning process."

(Allagani and Ali, 2003: 98)

A proposed strategy for the concept cell: a proposed strategy for active learning strategies and includes the following steps

1. The teacher divides the students into quadratic groups
2. Students begin to extract key concepts and ideas
3. Cell Concepts are configured and linked to different concepts

4. The cell is displayed in front of the row  
5. The teacher discusses the students' findings and selects the best cell that includes all the basic ideas of the lesson topic

6. The teacher discusses each cell and how it is used to solve problems.

Proposed Information Gap Strategy: A proposed strategy for active learning strategies that includes the following steps

1. The teacher divides the students into two or four groups so that each student gives an incomplete table so that the first table in the second table is completed and vice versa.

2. The teacher asks the student to complete the other schedule.

3. After the students discuss the solution and the extent to which the information is reconciled.

4. The teacher then discusses the two tables on the blackboard.

5. Tell the teacher that the sentences they will represent the general content of the lesson.

Acquire mathematical concepts defined by both

- (Al-Sharif, 1996) are those things that we can find a natural or mathematical model that can be represented naturally, it divides the mathematical concepts into two basic parts are things and links and divides links into processes and relationships, and mathematical concepts are either preliminary and derived from their sensory experience By the external world or secondary concepts are concepts derived from the initial concepts by linking relationships and the formation of a new concept higher grade than its predecessor, which has a natural model of mathematical representation. (Al-Sharif, 1996: 36)

- (Abu Zeina, 2003) are tight buildings that are closely linked to be at the end of an integrated structure and that the building blocks of this building are concepts.

(Abu Zeina, 2003: 199)

Theoretical definition: The researchers adopted (Al - Sharif, 1996) Procedural Definition: A group of abstract information or the group to be taught to the second grade intermediate students and combined by characteristics or characteristics (common) indicative of a particular symbol.

Theoretical Background:

Active learning :

Learning is based on the diverse activities of the learner and through which behaviors are based on the learner's positive participation in the educational situation or learning, and active learning is not a modern concept discovered at the present time, but is due to educational leaders such

as Socrates and John Dewey, Socrates used the questions through which problems were raised to help his students gain knowledge through the development and expansion of critical thinking processes and find different solutions to the problems of this world Socrates, but through the view of the world John Dewey was the first to try Arafa potential students learn the best and fastest ways, as it reached across the philosophy of pragmatism, the active learning methods is one of the best methods that help students to learn in a clear and sound. (Selim et al., 2015: 15)

The importance of active learning?

Increases student interaction in the classroom

2 - makes the educational process is fun

3 - increases social cohesion between students on the one hand and between the teacher on the other

4. Develops self-confidence and the ability to express opinions

5 - develops wishing to speed learning

6 - Urges students to follow the principles of education and develop positive attitudes towards learning

7. Promotes students' responsibility and initiative

The role of teacher and learner in active learning?

First the role of the teacher:

1- Prompt to learn

2 - establishes principles for students to deal within the classroom

3 - gives a variety of activities and different teaching methods consistent with educational attitudes and possibilities of students

4. Using different methods of participation and self-reliance

5 - work on the interdependence and communication between the environment of students and knowledge and accumulated experiences accumulated

6. Increases students' motivation to learn

Second: the role of the learner:

1- Work on self-evaluation of the learner

2 - works as a researcher of knowledge

3 - uses different educational activities

4. Use cooperative work inside the classroom

5. Give freedom to ask new questions and ideas

(Kariman Mohammed Bedair, 2012: 39)

Mathematical concepts:

Mathematical concepts are abstract objects that can form a model that is either natural or mathematical that can be synonymous with the

natural model, mathematical concepts are divided into first things second into links and divided links into relationships and processes, and classified mathematical concepts into primary concepts and secondary concepts, The primary concepts, which are derived from the knowledge and sensory experiences associated with the outside world, the secondary concepts, which are derived from the primary concepts by linking relationships and creating a new concept higher grade than the previous one, which has a natural model representable mathematics. (Al-Sharif, 1996: 26)

According to Abu Zeina (the most important characteristic of modern mathematics nowadays is that it has become not just routine operations or separate skills, but has become tight buildings that are closely related to each other to be an integrated structure and that the building blocks of this structure are concepts)

(Abu Zeina, 2003: 199)

Basic concept components

1- The concept space: It includes all the qualities, properties and features that are available in the cases that are consistent with the concept. A uniform characteristic is that each pair of ribs is parallel regardless of whether it is square, rectangular or particular.

2 - The term concept: The concept is called based on the characteristics common to the elements of his space, for example in the previous concept is the term of the concept is “parallelogram”.

3. Content of the concept: It is a phrase that is given to the concept and defined and is a summary and synthesis of the properties available in the elements of the vacuum that distinguish them from others formulated in a sentence that gives meaning and reflect the general picture of those properties. For example, “Parallelogram” is expressed in a useful sentence, which is a quadrilateral with a couple of parallelograms (Al-Sharif, 1996: 27-28).

Concept uses

Abu Zeina (2011) mentions the concept of three uses:

1. Idiomatic use of the concept: This use is concerned with the characteristics of things that fall within the framework or limits of the concept or term denoting the concept, as we talked about the characteristics and qualities of numbers that are called real numbers or the conditions that determine the real number when we use the term real numbers.

2 - Semantic use of the concept: It is a classification of examples of the concept of the examples of the concept when we use the concept of the right number to distinguish it from other numbers.

3 - Conceptual use of the concept: There are some concepts that can be



realized only by definition through the use of verbal or linguistic example of the concept of space or size

(Abu Zeina, 2011: 202)

previous studies :

Studies dealing with structural theory in general since there is no study on the independent variable, including:

1. Study (Yasiri, 2016): This study was conducted in Iraq, aimed at knowing the use of three teaching strategies and their impact on achievement and mathematical thinking among students of the middle stage was the size of the sample (123) female students from the second average, and in the light of the results that were treated statistically The results indicated that there is an effect of using three teaching strategies in achievement and mathematical thinking among middle school students for the experimental group.

Studies dealing with the dependent variable, including:

1. Al-Taie et al. (2014): The Effect of Using Gerlac and Eli Model on Acquisition and Retention of Mathematical Concepts among Second Grade Intermediate Students. In the Second Intermediate Students, the sample size was (60) Second Intermediate Students. The results indicated the effect of using Gerlac and Eli model on the acquisition and retention of mathematical concepts among second graders for the experimental group.

Research Methodology and Procedures:

The procedures used in the research will be presented in this chapter, starting with the experimental design and determining the research community and the sample, the equivalence of the experimental and control groups, the tools used in data collection and preparation steps, the method of their application, as well as the steps of two proposed strategies for active learning and the acquisition of mathematical concepts. Results.

First: Research Methodology and Design:

Research Methodology: To achieve the research objective, the quasi-experimental approach was adopted, because this approach is suitable for research variables. The researchers adopted the experimental design with three equal groups, two experimental groups, and the third control, with post-test, because it is one of the most suitable designs for the current research, as in the figure. The following shows the experimental design adopted in the research

Groups		In depend variable	Depend variable
Experimental group1	Equivalence between two gropes in some variables	Cell Concepts	-acquisition Mathematical Concepts
Experimental group2		Information gap	
Control group		Normal way	

Research community: The research community includes students of the second intermediate grade in the middle and high schools day government of the Directorate General of Education Baghdad / Rusafa third / for the academic year (2018-2019).

Research sample: The dawn medium for boys of the Directorate General of Education of Baghdad / Rusafa III was chosen intentionally to apply the research experiment to show the school administration its willingness to cooperate with the researchers. B) To represent the students of the second experimental group and Division (C) to represent the students of the control group, the students who were failing were excluded so that their previous experience does not affect the results of the research. The following:

Athfinds	Number of fascinists	Number of eye students befor preparing	Division	Group
33	5	38	A	Experimental 1
33	6	39	B	Experimental 2
34	3	36	C	the Control
100	14	113		total

Research Tool: Test the acquisition of mathematical concepts

One of the requirements of the research is to build a test to measure the

skills of acquiring mathematical concepts at the sample of the research, where researchers prepared the test paragraphs in accordance with the content of the subject, and agencies:

1. The educational material is defined by the vocabulary of the mathematics book for the second intermediate grade / first part.
2. Preparation of a test for the acquisition of mathematical concepts, and each concept of three paragraphs according to levels (remember, understand and apply) consisting of (39) paragraphs of multiple choice type of four alternatives, one of which is true.
3. Salah Paragraphs: After the initial test was prepared, it was presented to a group of experts, to explore their views on the validity of paragraphs to measure the acquisition of concepts in the light of content, and promised the paragraphs valid as it got an agreement rate (80%) and more, and in the light of That amended some paragraphs.
4. Formulate test instructions and answer: Test instructions are formulated in terms of determining the purpose of the test, the type of questions, the method of answer, and the time available to answer questions.
5. Correction Instructions: A typical answer was developed for all paragraphs that were used in the correction of the test. A score of (1) was given for the correct answer and (0) for the wrong answer. As for the abandoned paragraphs, the wrong answer was treated. Thus, the degree of total response ranged from zero to 39 degrees.
6. Exploratory application: To find out the clarity of the instructions and measure the test time, the test was applied to a sample of (42) female students of the second grade of middle school (Al-Jawaher), and found the appropriate time to complete the test is (50 minutes) and found that most of the paragraphs It was clear.
7. Statistical analysis of the test paragraphs: After correcting the papers of the exploratory sample of (100) students were arranged in descending order and then divided into two higher and lower groups by (27) students in each group. The grades were treated statistically as follows:
  - Paragraph difficulty coefficient: According to the difficulty coefficient of each paragraph by adopting the equation of the difficulty of the paragraph, the value ranged between (0.33 - 0.68) and thus signed test paragraphs within the acceptable range.
  - Paragraph discrimination coefficient: The coefficient of discrimination was calculated for each of the paragraphs, where the value ranged from (0.23-0.52). (40% and above).
  - The effectiveness of alternatives: The wrong alternative is effective when

attracted more students from the lower group than the number of students of the upper group attracted by that alternative (Baghdadi, 1998: 129) It turned out that the alternatives achieved this purpose after unloading the grades of students from the tables.

8. Validity of the test: To verify the validity of the test, the following methods have been adopted:

- Virtual honesty: Many researchers and specialists in the field of psychology and education that the concept of virtual honesty is not true truth, but is a formality, a process is not at the test level, as it does not refer in fact to what is actually measured by the test or test, but all it shows is only In its superficial image. (Anastasia, 1976: 139)

- Validity of the content: It has been verified by presenting the test and the behavioral objectives and the content of the educational material to a group of arbitrators to indicate the extent of the test conformity to the content of the article, and accordingly the test designed to be honest because it describes the above, and got the test (80%) More than the opinions of the arbitrators.

Building Validity: The Building Validity was found by finding the relationship of the paragraph to the total score of the test. This indicates the internal consistency of the test paragraphs.

9. Stability of the test: Stability of the test is intended to be “a high degree of accuracy, mastery, consistency and objectivity in what is put to measure.” The coefficient of stability of the test was determined by the Koder-Richardson equation (20) and reached (0.90) which is a good value. After verifying the significance of honesty and consistency and statistical analysis of the paragraphs, the test of acquiring mathematical concepts is ready for application.

Statistical means:

The statistical program SPSS version (20) was adopted to extract the results of the study, the following statistical methods were used:

1. Difficulty Factor for Objective Paragraphs: I use to extract the difficulty of each paragraph of the test of acquiring mathematical concepts.
2. Coefficient of Discrimination for Objective Paragraphs.
3. Effectiveness of the wrong alternatives: used for the purpose of calculating the effectiveness of the wrong alternatives to the substantive paragraphs in the test of the acquisition of mathematical concepts.
4. T-test for two independent samples (t-test): used to make equivalence among students of research groups.
5. Pearson correlation coefficient (r): used to find out the correlation coef-

ficient of the degree of each paragraph with the total score of the test, and with the total score of the field to which it belongs.

6. The Kyoder-Richardson equation (20) was used to find the stability of the test.

7. One Way Analysis Of Variance: It was used for the purpose of equivalence of the research groups as well as indicating the differences between the results of the three research groups.

(Awad and Abu Saleh, 1990: 333)

8. Scheffe Test: This test was used to detect the direction of significant differences between the three research groups.

9. View and discuss results

Acquisition of scientific concepts:

Zero hypothesis: "There are no statistically significant differences at the significance level (0.05) between the mean scores of students studying according to the proposed concept cell strategy, students studying according to the strategy of the proposed information gap strategy, and students studying according to the usual method of acquiring. Mathematical concepts for second grade students in mathematics.

For the purpose of validating the first hypothesis, the average scores of each group for the three research groups in the collection were calculated, as shown in the following table:

The Control	Thesecond Experimental	First Experimental	THE DATA
34	33	33	The number
27.11	30.21	33.24	Average Arithmetic

To verify the main hypothesis, ANOVA was used to determine the significance of the differences between the averages. The following table shows:

Statistical significance at (0.05)	F the value		Average squares	Df.	total Of squares	Contrast of conteast
	calaulated	tabular				
sign	3.11	6.103	282,838	2	565.67	Between groups
			46.341	97	077.45	Inside groups
				99	753.51	total

The above table shows that the computed value is greater than the tabular value. This indicates that there is a statistically significant difference in the acquisition of mathematical concepts for the three research groups, and therefore rejects the first zero hypothesis and accepts the alternative hypothesis.

For the purpose of investigating the significant differences between the three research groups in the sub-hypotheses, the post-Scheffe test was used to make marital comparisons between the groups as follows:

Results related to the first sub-hypothesis:

Which states: “There is no statistically significant difference at the level of significance (05.0) between the average scores of the first experimental group students (who study mathematics according to the proposed concept cell strategy for active learning) and the grades of the control group students (who study mathematics according to methods. In mathematical concepts.

Using the CHEVEA test, the CHEVEA value calculated between the first and control experimental groups was found to be 7.25, which is greater than the critical value (6.203), as shown in the following table:

Statistical significance at (0.05)	results	Critical chevy value	Calculated chevy value	comparisons
sign	There are significant differences	6.203	7,25	Experimental 1
				Control
no Sign	There are no significant differences		3,97	2Experimental
				Control
No sign	There are no significant differences		3.28	Experimental 1
				2Experimental

The result presented in the previous table indicates that there is a

statistically significant difference at the level (0.05) between the average grades of students of the first experimental and control groups in the acquisition of mathematical concepts, thus rejecting the first zero hypothesis.

The researchers attribute this result to the fact that the proposed concept cell strategy has been instrumental in increasing mathematical concepts.

This finding is consistent with the study (Al-Yasiri 2016).

Results related to the second sub-hypothesis:

It states: "There is no statistically significant difference at the level of significance (05.0) between the average scores of the second experimental group students (who study mathematics according to the information gap strategy proposed for active education) and the grades of the control group students (who study mathematics according to methods. In mathematical concepts.

This hypothesis has been verified using the CHEVE test. The calculated CHEVE value between the two experimental groups and the control group was equal to (3.97) which is less than the critical value (5.855) as shown in the previous table. The second experimental and control group in the collection and thus accept the second hypothesis zero sub.

Although there were no statistically significant differences between the two groups, the results presented in the previous table show that the average test of acquiring mathematical concepts in the second experimental group studied by the proposed information gap strategy is (30.21) which is greater than the average of the control group (27.11). This demonstrates the relative impact of the proposed information gap strategy.

Results related to the third sub-hypothesis:

Which states: "There is no statistically significant difference at the level of significance (05.0) between the average scores of the first experimental group students (who study mathematics according to the proposed concept cell strategy for active learning) and the grades of the second experimental group (who study mathematics according to The proposed information gap strategy for active learning) in the mathematical concepts acquisition test.

Using the CHEVE test, this hypothesis was verified and it was found that the CHEVE value calculated between the first and second experimental groups is (3.28) which is less than the critical value (6.203) as shown in the previous table.

This result indicates that there were no significant differences between the mean scores of the first and second experimental groups in the acquisition of mathematical concepts, thus accepting the third sub - zero hypothesis.

Researchers attribute this result to the equal effect of the two strategies in acquiring mathematical concepts for students.

Conclusions:

In the light of the results of the research, the researcher reached the following conclusions:

1. The students of the first experimental group studied in accordance with the strategy of the proposed concept cell for active learning at the expense of the control group (the usual method) for their positive impact on the acquisition of mathematical concepts for students.
2. There was no statistically significant difference between the second experimental group (the information gap proposed for active education) on the control group.
3. The absence of significant statistical differences between the mean scores of the first and second experimental groups in the acquisition of mathematical concepts.

Recommendations:

1. Define the teachers of mathematics during their preparation and training strategy cell concepts, the information gap, and how to prepare teaching plans in the light.
2. Training mathematics teachers on the proposed concept cell strategy for active learning so that they can help students acquire mathematical concepts.

Proposals:

1. Conducting further studies on teaching using the concept cell strategies, the information gap at other stages of study and studying their impact on other variables such as metacognitive skills, inclination, values and attitudes towards mathematics.
2. Conduct a study on the obstacles to the acquisition of math con-



cepts from the point of view of teachers.

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