The Effect of Karen's Model in The Achievement and The Development of Levels of Understanding Mathematics for female Students Intermediate

Assistant Prof.Dr.Rafah Aziz Kareem
Mustansiriyah University/College Of Education

Zuhra Mezaal Mezban
Mustansiriyah University/College Of Education

Abstrac

The aim of the research is to identify the effect of the Karen model on the collection and development of understanding levels of mathematics among middle school students.

The study sample consisted of (86) female students in the first grade for the second semester of the academic year (2016-2017). The average of Al-Mustaprq for Girls affiliated to the Directorate of Education of Rusafa in Baghdad was chosen as a random choice. (40) in the control group studied according to the usual method. The two groups were rewarded in the following variables: (age in months, previous information, IQ test, achievement score in the first semester, and testing levels of understanding of mathematics).

The results of the research tools were: the achievement test which consists of (40) objective paragraphs (multiple choice) and the transition, and testing the levels of understanding of mathematics according to eight levels (primitive knowledge, shape making, form ownership, property observation, (18) Mathematical concepts of each concept Eight paragraphs according to the levels of understanding were divided into two parts each part (9) concepts. Using the Alpha-Kronbach equation, the stability of the achievement test (0.81) and the stability of the test of comprehension levels (0.86) Two bars. After the experiment was completed, the achievement test was applied and the levels of comprehension (pre-post) were tested on the experimental and control groups.

After the data was collected and the test was used for two independent

samples and the analysis of the accompanying variance analysis and the quiz test was conducted. As the test of the tribal understanding levels was considered as an associated variable, the results were as follows:

There was a statistically significant difference between the experimental and control groups in the achievement test and the testing of the understanding levels in favor of the experimental group.

In light of the results of the research, a number of recommendations and suggestions were put forward. The most important of these were the following: Emphasizing the use of the Karen model in teaching mathematical concepts and revealing the levels of understanding possessed by students and developing them through modern models and appropriate means. Sex variable.

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Resumen

El objetivo de la investigación es identificar el efecto del modelo de Karen en la recopilación y el desarrollo de los niveles de comprensión de las matemáticas entre los estudiantes de secundaria.

La muestra del estudio consistió en (86) estudiantes femeninas en el primer grado para el segundo semestre del año académico (2016-2017). El promedio de Al-Mustaprq para niñas afiliadas a la Dirección de Educación de Rusafa en Bagdad fue elegido como una elección aleatoria. (40) en el grupo control estudiado según el método habitual. Los dos grupos fueron recompensados en las siguientes variables: (edad en meses, información previa, prueba de coeficiente intelectual, puntaje de logro en el primer semestre y niveles de comprensión de las pruebas de matemáticas).

Los resultados de las herramientas de investigación fueron: la prueba de rendimiento que consiste en (40) párrafos objetivos (opción múltiple) y la transición, y probar los niveles de comprensión de las matemáticas de acuerdo con ocho niveles (conocimiento primitivo, creación de formas, propiedad de formas, propiedad observación, (18) Conceptos matemáticos de cada concepto Ocho párrafos de acuerdo con los niveles de comprensión se dividieron en dos partes cada parte (9) conceptos. Usando la ecuación de Alpha-Kronbach, la estabilidad de la prueba de rendimiento (0.81) y la estabi

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lidad de la prueba de los niveles de comprensión (0.86) Dos barras Después de que se completó el experimento, se aplicó la prueba de rendimiento y se probaron los niveles de comprensión (pre-post) en los grupos experimentales y de control.

Después de que se recopilaron los datos y se usó la prueba para dos muestras independientes y se realizó el análisis del análisis de varianza adjunto y la prueba de prueba. Como la prueba de los niveles de comprensión tribal se consideró como una variable asociada, los resultados fueron los siguientes:

Hubo una diferencia estadísticamente significativa entre los grupos experimentales y de control en la prueba de rendimiento y la prueba de los niveles de comprensión a favor del grupo experimental.

A la luz de los resultados de la investigación, se presentaron una serie de recomendaciones y sugerencias. Los más importantes fueron los siguientes: enfatizar el uso del modelo de Karen en la enseñanza de conceptos matemáticos y revelar los niveles de comprensión que poseen los estudiantes y desarrollarlos a través de modelos modernos y medios apropiados. Sexo variable.

(1-1): Research problem:

Mathematics is a difficult science for the learner because it contains a lot of abstract concepts that need to be clarified and rounded to his mind so that he can understand, understand and learn it. The mathematics subjects are hierarchical and have not been learned well enough to refer to and adopt to understand and learn new topics .

Perhaps one of the reasons that led to the study of this subject is the low achievement in mathematics, which is one of the problems facing teachers and researchers This is what was shown by the results of studies conducted in Iraq as a study (Aliawi, 2013), and study (Fahd, (2015, study (Yasiri, 2016).

The teachers of mathematics present the mathematical subjects as they are in the book, which leads the majority of students to save examples, exercises, theories and even the sequence of mathematical topics without meaning, and this naturally leads to weak achievement in sports (Khazraji, 2013), as confirmed by teachers Mathematics Supplement (B-2) in an open questionnaire (Appendix A-3) was distributed to them.

As a result of students 'focus on conservation without understanding and the teaching method used in presenting this content, which depends on training and indoctrination, the students' weakness in the absorption process is confirmed by the study (Al-Aqbi, 2002: 3).

The researcher directed a questionnaire (3-B) for a group of teachers and teachers of mathematics for intermediate stage (2-B) to detect any levels

possessed by students of the first grade intermediate? As a result of the question-naire, there is a defect in the levels of understanding and table (1), which shows that the researcher's knowledge of many studies such as the study (Al-Aqbi, 2002) and Shara (2006) Models that may enhance the levels of understanding and deve-lop them, so the researcher decided to try one of the teaching models is Karen Tritia model of the contribution of this model in addressing this problem.

Table (1) Percentage of the result of identifying comprehension levels

	% Ratio	The level
1	%53	Primitive Knowing
2	%46	Image Making
3	%40	Image Having
4	%33	Property Noticing
5	%26	Formalizing
6	%20	Observing
7	%13	Structuring
8	%6	Invention

Based on the above, the problem of research can be determined by the following question:

(What is the effect of Karen's model on the achievement and development of mathematics understanding levels among middle school students?).

(2.1): Research Importance:

1. Try to highlight the level of understanding among the first grade students.

2. It may contribute to the improvement of educational models that lead to an in-depth understanding of scientific knowledge away from direct indoctrination.

3. This research may provide necessary information about Karen's model and its impact on teaching.

4. The importance of the intermediate stage, which occupies an important place in the educational ladder, it represents the middle link between primary education on the one hand, and preparatory education on the other.

5. The absence of a local study (according to the two researchers) examines the

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effect of the Karen model on achievement and the development of understanding levels of mathematics among middle school students, which gives importance to the current study.

(3-1) Research Objective:

The current research aims to identify the effect of the Karen model in:

1 - Achievement in mathematics for students of the first grade intermediate.

2. Development of levels of understanding of mathematics (primitive knowledge, shape formation, shape acquisition, property observation, generalization, understanding of observation, construction, and invention) of first-grade students.

(4-1): Research Hypothesis:

The researchers will test the following zero hypotheses:

1. There is no statistically significant difference at the level of significance (0.05) between the average score of the female students of the experimental group who will be taught according to the Karen model and the average score of the students of the control group who will study according to the usual method in the achievement test.

2. There is no statistically significant difference at the level of significance (0.05) between the average score of the students of the experimental group who will be trained according to the Karen model and the average score of the students of the control group who will study according to the usual method of testing the levels of understanding of mathematics as a whole and each of the eight levels of understanding: (Primitive knowledge, shape making, shape ownership, property observation, generalization, understanding of observation, construction, and invention).

3. There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who will study according to the Karen model in the test of each level of understanding (pre-post): (primitive knowledge, shape making, , Generalization, understanding of observation, composition (construction), and invention).

4. There is no statistically significant difference at the level of significance (0.05) between the average scores for the control group students according to the usual method of testing the levels of understanding (tribal - post).

5.1 Limits Research:

1 - students of the first grade intermediate in the Directorate General of Education Baghdad / Rusafa first semester of the second year 2016-2017)).

2 - Topics of the book of mathematics for the first grade intermediate Part 2, edition 1, 2016 m of the chapters (V: Engineering, VI: Measurement - areas and volumes, VII: statistics and probability).

Level 3: Shape Ownership, Level 4: Property Note, Level 5: Circular, Level 6:

Understanding Control, Level 7: Composition (Construction), Level VIII: The invention).

(6.1) Definition of Terms:

1. Karen's Model

(Attia, 2016) is an integrated multi-disciplinary teaching model based on the foundations of cognitive theory. Its idea derives from the meaningful learning theory of Uzebel in terms of advanced organizations, conceptual maps and Piaget's constructivist theory in relation to the total theory. These two theories made the learner the focus of the learning process , 2016: 337).

The researcher adopted the definition (Attia, 2016) as a theoretical definition for its suitability for research procedures.

Procedural definition: is a set of organized and integrated steps of :-(hierarchical organization of learning content, activation of previous information, definition of concept, introduction of advanced regulator, gradual differentiation of ideas, assessment and refinement of concepts). The experimental group has undergone these steps within the classroom to Its impact on achievement and in the development of levels of understanding of mathematics.

2. Understanding mathematics

Pirie and Kieren (2003) defined it as: the phenomenon of repetition and repetition, which occurs when the thinking moves between levels of evolution (evolution, primitive knowledge, form making, shape acquisition, property observation, generalization, understanding of observation,), Each level of understanding is a part or content at the levels that preceded it, 2003: 143 (David E. Meel)

Procedural definition: The ability of first graders to average the response at levels of comprehension (primitive knowledge, shape making, form ownership, property observation, generalization, understanding of observation, structure, and invention) is measured by the degree obtained by the student .

3. Layers understanding of mathematics

The definition of mathematics is a process of understanding of mathematics comprising eight levels: (primitive knowledge, shape making, shape acquisition, observation of property, generalization, understanding of observation, structure, and invention) allow first-grade students to move between levels in case they possess the required information Per level.

The theoretical framework

: (1-2) Karen's Model:

The model is an integrated multi-disciplinary teaching model based on cognitive theory. Its idea is derived from the meaningful learning theory of Uzbal in terms of advanced organizations, concept maps and Piaget's constructivist

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constructs. In the overall view, these two theories, which have made the learner the focus of the learning process, draw some principles And the learning process at Piaget and the investment of previous knowledge and its activation and acquisition of new knowledge in the framework of an integrated structure of cognitive knowledge adapted to the requirements of the position Lemme (Attia 0.2016: 337).

(2-2): The stages of teaching according to the Karen model

1) The stage of hierarchical organization of the content of learning: The unit is organized in a hierarchical way that includes all the main concepts and subsections that are included within the unit. To ascertain this stage, students are asked about any concept, whether president or branch. To strengthen them.

2) The stage of activating the previous knowledge: Through the introduction of real-life examples and then discussed with the students are stimulated information stored in the structure of knowledge, and to ensure the achievement of this stage are asked to give other examples.

3) Definition stage of the concept: After providing a definition of the concept Continuing education in a question and answer method for examples and examples and to ensure the achievement of this stage raises several questions related to the concept and ask students to explain and explain.

4) Advanced Organizer: After activating the previous knowledge and preparing the knowledge structures of the students to receive the new learning and define the concept and know the characteristics that distinguish it from the other comes the stage of presenting the advanced organizer prepared by the teacher in advance and this on the board or graphic and then the teacher the following procedures:

- Draw the attention of learners to the content of the advanced organizer and incorporate the concepts from year to year.

- Introducing the relationships between the components of the advanced regulator.

- To highlight the characteristics that characterize each concept contained in the organizer, including the general concept and concepts for adopting a criterion in separating examples and examples from the concept.

 - Provide examples that support the explanation of each concept in the advanced organizer, with all these examples of all the characteristics of the concept so that the property is evident in the example provided by the teacher.

The teacher must maintain the momentum of the attention of learners and their attraction to the lesson and interact with the teacher in all steps of learning by various means, including questions and analysis and highlight the distinctive characteristics and the introduction of problems and others (Attia, 2016: 338).
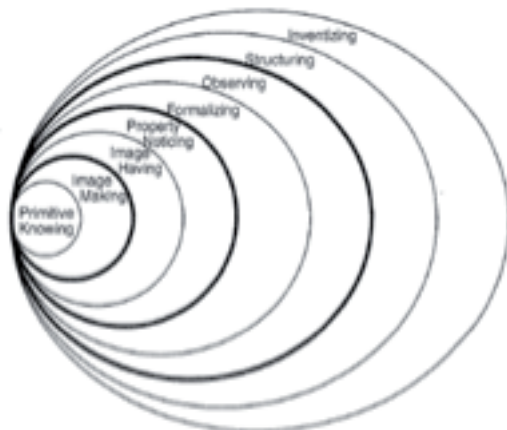
5) Stage of gradual differentiation between ideas: After the stage of presentation of the advanced organizer and explain the concepts contained in the stage of gradual differentiation, which is among the calls of the theory of Ozbl, at this stage is the process of analysis of general ideas to ideas less and less with the presentation of ideas of differences and differentiation, The differentiation from the general concept to the most personalized approaches to the initial concepts and concepts of learning content (Attia, 2016: 339).

6) Calendar and refinement of concepts: At this stage the information is refined and verified in the cognitive structure of the learners through the following procedures: - Identifying the similarity between ideas and concepts in the subject of learning based on what the stage of gradual differentiation of distinctions between concepts, Concepts.

: (2-3) Berry and Kerrin levels of understanding

Perry and Kerrin proposed a theory that describes the stages of growth of mathematical understanding as a whole rather than a linear process (Pirie and Kieren, 1991). This theory attempts to explain in detail the structural definition of understanding as a continuous process of organizing the individual's cognitive structure (Glasersfeld, 1987).

The two researchers adopted the levels of understanding for Perey and Kerrin consisting of eight indivisible levels as shown in Figure (2).

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Internal Construction and Comprehension Vehicle Theory by Perry and Kerrin Each episode (level) will be illustrated in some detail, namely: -

 Primitive Knowing: This is the starting point of the understanding process. It is the essence of the model. We do not mean a low level of mathematical understanding. It is all the information that is brought to the educational situation of the student. The teacher assumes that the student has a specific subject when He wants to teach him (Pirie and Kieren, 2003: 144).

   For example, a particular concept such as a cone, the school can expect from the student several answers that may be true or incorrect as the student who has a prior knowledge of this concept has the priorities that achieve this level.

2 - Making Image Image Making: The ability of the learner to develop differences based on his abilities and knowledge of the past, and these forms are not necessarily (symbols of visual representations) but the meaning of any kind of mental forms, the actions in this layer include the act of the learner either mentally or physically something to Acquires an idea of the concept of Pirie and Kieren, 2003: 145).

   At this level, the school introduces the concept of the cone with two or more concepts and asks the students to refer to the concept of cone and clarify what is different from other conceptions and if they can not express verbally can provide an actual answer to describe the concept movements and reference or drawing on the blackboard.

 3. Image acquisition: The learner has a form of activity in which one develops one mental image, the more precise one, namely, the liberation of the learner's mathematics from the need to perform certain physical functions. The learner begins to distinguish the obvious global characteristics of the mathematical forms examined

(Pirie and Kieren, 2003: 145).

After the students knew the concept of the cone and its characteristics, they could conceive of the concept. The school could introduce several concepts, including the concept of the cone, and ask the students to choose the shape that represents the cone and if they choose the correct one they can move to the next level.

 4. Note Property Noticing: It is possible for the learner to examine the form and determine the various characteristics associated with this form. In addition to observing the internal characteristics of a particular form, the learner is able to observe the differences and combinations or relations between the multiple mental forms. These characteristics combine to construct definitions that may define or define certain characteristics while ignoring other elements of the concept (Pirie and Kieren, 2003: 145).

   For example, after the students had acquired the concept of the cone, it

became easy to learn and observe the characteristics of the concept that distinguish it from other mathematical concepts.

 5 - Understanding the formulation Formalizing: It is the student's ability to generalize a particular characteristic of a previous image based on what he has observed, namely that at this level the student can extract the common property and circulate them to new positions similar or understand certain mathematical methods through previous mathematical ideas Pirie and Kieren, 2003: 145).

 Here are presented the positions of life from the reality of female students apply to the shape of the cone such as Babanuel hat and ice cream and then will be able to students to understand many cases about the concept.

6. Observation: the ability of the learner to take into account the formal thinking and review, and after the learner is connected beyond the perception, it is able to be observed, builds and organizes its own intellectual processes also distinguishes the ramifications of intellectual processes, and in this layer can learner to produce The verbal expressions of perception about the concept that the learner, after acquiring this awareness, can now interpret the interrelationship of these observations and explain them by a self-explanatory system (Pirie and Kieren, 2003: 145).

 In our example, students at this level of comprehension have acquired a comprehensive conception of the concept and its developments. If the school gave an example of the cone and asked them to answer, they would be able to explain and explain why they do not represent the cone concept and then move to the higher level.

 7. Structuring: The learner has begun to see the relationships between different subjects and to ask specific questions about the ideas, facts and examples that are behind them, connects these ideas across many areas and realizes the interrelationship between several theories. The learner may now be able to visualize evidence For its understanding of the characteristics associated with the concept (Pirie and Kieren, 2003: 145). At this level, when a question was posed to the students about the relationship between the shape of the cone and the shape of the star pyramid? They will begin to see the relationship between the concept of the cone and the concept of the pyramid by thinking in a proper way, arriving at the specific structures and evidence for each concept, which in turn leads to the discovery of the relationship.

8. Inventioing: The ability of the learner to create (create) completely new questions that lead to the development of a new concept. In this class, the mathematical understanding of the learner is not specific and imaginary and goes beyond the current structure to reflect on the question of "what if?" This question results in the learner's use of cognitive construction (cognitive struc

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ture as a primitive knowledge when he later explores the primary field of discovery Pirie and Kieren, 2003: 144-147).

The school here wants to reach the students to the stage of innovation and creativity. This is done by crystallizing the questions in a way that allows them to think and meditate. The answer may be one or multiple answers. In our previous example, what if we draw an object from the rotation of an angle triangle around one of the two sides complete? The student will think in her imagination about what the object is, which is the rotation of an angle triangle and may reach the correct answer or may not reach.

Search procedures:

(3-1): Experimental Design

The choice of experimental design is the first steps that the researcher has to undertake when conducting a scientific experiment, since the accuracy of the results depends on the type of experimental design chosen that gives a guarantee to overcome the difficulties encountered in the statistical analysis, and the results of experimental research depends on the type of experimental design used (2002, 2002). Therefore, the researcher used semi-experimental design with pre-test and post-test for two groups, one experimental and the other control because it conforms to the research objectives.

Table (2) experimental design of the research

Post-test	dependent variable	Independent variable	Tribal Test	Parity of the two groups	group	s.
				The chronological age calculated by months	Experimental	1
Collection Levels of understanding	- Collection test - Test levels of understanding	Karen's model	Levels of understanding	Previous achievement in mathematics Test previous information . JQ test Test levels of understanding	Control	2

(2.3): Research Community and Sample (Research population & Sample)
Research Community Research population:

The research community represents middle school students in all the middle and secondary schools in the General Directorate of Baghdad governorate education / first Rusafa for the academic year (2017-2016)

Sample Research: A medium medium was selected as a sample for the school community, according to the facilitation task book as in Appendix (1) for the following reasons:

1 - proximity to the researcher's residence, which facilitated the smooth flow of time to apply the experience.

2 - To show the principals of this school and the schools of mathematics in cooperation with the researcher.

3. The existence of eight people taught by the same material schools.

Table (3) Distribution of female sample students in the two study groups

The sample	Number of exceptions	Number of female students in the sample before exclusion	Division	the group	
46	4	50	a	Experimental	
40	5	45	b	Control	
86	9	95		total	

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(3.3): Control Procedures

A - The internal safety of the experimental design: The dependent variable may be affected by several factors other than the independent variable. These factors must be controlled and the independent variable alone should be allowed to influence the dependent variable.

(Obeidat, 1998: 282).

In order to achieve equivalence among female students, statistical analysis was conducted in some research variables that affect the results of the research as in the following table:

Table (4) Statistical description of the experimental and control groups in equivalence variables

At a level)0,05(	est value		andard error of the thmetic mean	viation andard	SMA	mber The dents	the group	Variables
	table	calculate☐						
Not inction	990	0,0	0,4387	2,975	151,891	46	Experimental	The chronological age
			0,547	3,463	151,825	40	Control	
Not function	990	1,3	1,941	13,165	79,434	46	Experimental	Previous collection
			2,327	14,719	75,300	40	Control	
Not function	990	0,9	0,349	2,3733	12.478	46	Experimental	Previous knowledge
			0,461	2,9172	11,950	40	Control	
Not function	990	0.3	2.611	17.713	85.847	46	Experimental	Levels of understanding
			1.214	12.142	84.800	40	Control	

Intelligence:

There is no doubt that the intelligence of the variables that affect the integrity of any experience in the field of education and ensure the equivalence of the two groups, the researcher conducted the matrices sequential Raven codified on the Iraqi environment of Dabbagh because of this test of honesty and stability and favor for the age group of the research sample (Dabbagh and others, 1983: 45).

Table (5)

X2 value of the difference in the IQ of students of experimental and control groups

Statistical function At a level of significance (0.05)	x-value		total	Level of intelegent			unit	the group
	table	calculate		good 95%-75%	middle 75%-25%	Under middle 25%- 5%		
Not function	5.990	0.275	46	3	24	19	☐	Experimental
			40	1	24	15	☐	Control
			86	4	48	34		total

External safety of experimental design: The two researchers set some variables are as follows:

a. Teacher: The researcher maintained this variable by teaching the experimental and control groups themselves.

B. Place of the experiment: In cooperation with the school administration, a hall was allocated for the experiment of both groups.

C. Scientific Article: The same scientific material was submitted to the two groups.

H. Experimental Extermination: It is the effect of leaving a number of students (sample of study) or their interruption during the duration of the experiment. "There was no interruption, transfer or leaving of any student in the period of application of the experiment.

Dr. Distribution of Weekly Quotas and Their Number: To ensure equivalence, the number of rations was (10) rations per week (5) per group, and the school administration organized the table as the distribution of quotas was close to both groups.

Testing: The experimental and control groups were tested for achievement and

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levels of understanding of mathematics (pre-post).

(4.3): Research Accessories:

1. Limiting the scientific material limiting the Academic material:

   The researcher identified the scientific material that will be taught for the two research groups in the second semester of the academic year (2017-2016). This includes the mathematics book for the first intermediate grade, the first edition of 2016, which is the three chapters: Engineering - Measurement - Area and Volume - Statistics and Probability

2. Identifying concepts concepts limiting the:

   Because the Karen model takes into account learning experiences involving multiple situations in which concepts can be used as well as containing the model on steps related to the concept (Attia, 338: 2016-) 337

Therefore, the scientific material of the research and the extraction of concepts were analyzed. The researcher extracted the main concepts and sub-sections (8) and was presented to a group of specialists in the teaching methods of mathematics and some teachers (Appendix A-2) (11) shows the number of concepts in each chapter.

Table (6) The main and secondary concepts in the content of the experiment

Total no	Sup Concepts	Main Concepts	Chapter
45	32	13	Chapter V
26	22	4	Chapter six
8	3	5	seventh chapter
79	57	22	Total

3. Formulation of behavioral objectives:

In the light of the general objectives of teaching mathematics for the first intermediate grade, the second semester of the three classes to be taught during the period of the experiment, the researcher formulated the behavioral objectives (7) and presented them to a group of arbitrators (Appendix A-2) For the purposes of teaching the three classes according to Bloom's six cognitive levels (knowledge, comprehension, application, analysis, composition, and evaluation) as shown in Table (7).

Table (7)

Number of behavioral purposes for each of the six levels of the mathematics book scheduled for the three classes

	Calendar	Composition	Analysis	Application	Absorption	Knowledge	Content
	3	3	4	12	25	30	Chapter V
	3	3	5	17	13	15	Chapter six
	□	□	□	4	11	12	seventh chapter
	6	6	9	33	49	57	Total

4 - Preparation of teaching plans Preparation of instructional plans:
A) Pilot group plans
   A sample of these plans was presented in Appendix (6) to a group of arbitrators and specialists in mathematics and methods (A-2) to learn their opinions, observations and proposals to improve the formulation of these plans, and to make them sound, ensuring the success of the experiment and in view of those views and proposals have been modified to be ready for implementation.
1) The stage of hierarchical organization of the content of learning: The school analyzes the study material and extract the main concepts and subdivisions of each unit of study and then organize them hierarchically, where the concepts from the main to the sub-clarify the relationships between them and then attached to this concept map in the classroom and on the wall in front of students .
2) The previous knowledge activation stage: The previous knowledge of the students is reviewed by linking students from previous experiences and information with real life examples related to the subject of the lesson using interesting educational means.
3) Stage Definition of the concept: At this stage the school writes the definition of each concept contained in the lesson on the blackboard with the provision of each concept of the national and non-affiliated with the reasons cited and reinforced by the immediate activity of the questions of evaluation to raise the female students.
4) The stage of presenting the advanced organizer: At this stage the school will draw a hierarchical layout of the advanced organizer to present to the students in which the main concept of the lesson with the secondary concepts in the relationships and words and lines supported by the ideal and exemplary means of teaching different to attract the attention of students to study and interact with the school.
5) Stage of gradual differentiation between ideas: Here the school refers to the main concept and then subtracts the secondary concept that is related to the main concept where the ideas are gradually analyzed through the Q & A until the interaction within the classroom.
6) Calendar and refinement of concepts: The school distributes individual calendar papers that include questions about the hemisphericity and the difference between mathematical concepts and some definitions in their own language. This stage helps to integrate students' knowledge in a real way with their previous information.
(B) Plans of the control group
The number of (50) plans according to the regular method of teaching students

in the control group (40) students, as follows:
- Set goals for lessons for search.
- Organizing daily teaching plans, including for behavioral and evaluation purposes.
- Presentation of the attached form (6) of the teaching plans prepared for teaching the control group to a group of experts (Appendix A-2) to benefit from their observations about their suitability to the content of the subject and behavioral purposes.
- The lesson was presented according to the sequence of the book and the activities and exercises of the textbook.

(5.3): Research tools:
First: Achievement Test:
The test of the collection, which consists of the test (40) of which (34) paragraph with four alternatives, including one correct answer and the three alternatives are wrong and (6) paragraphs of the article. The test went through the following steps:
1. Objective of the test: The objective of the test is to measure the academic achievement in the mathematics of the students of the two groups after acquiring the information that was taught during the period of the experiment.
2. Determination of the scientific subject: Mathematics book for the first grade intermediate / part 2 / edition 1 / for the year (2016) of the three chapters (Chapter 5: Geometry, Chapter 6: Measurement, Area and Volume, Chapter 7: Statistics and Probability (Statistics and Prpbability
3. Behavioral Objectives: The objectives of the study were to evaluate the behavioral objectives of the levels of cognitive knowledge (BLOOM), as the importance of the goals comes as a guide to the researcher's work during the application of the experiment and the construction of the test and the preparation of daily teaching plans (Trick, 1999: 155).).
4. Determining the number of paragraphs of the test: It was agreed to (40) test paragraphs for the book of the second course, which is the three chapters is suitable for testing through consultation with arbitrators and teachers.
5. Preparation of the table of specifications: "A table consisting of two dimensions, one represents the content, the other represents the levels of goals, and works to link the content items, and the objectives to be achieved levels and different areas. (The Trick, 1999: 416)
It is usually referred to as percentage (weights) that reflect the relative importance of each of the content areas and each type of behavioral purpose and thus the specification table becomes the cornerstone for the preparation of any achievement test (Al-Ajili, 2001: 24)

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The researchers prepared the test map as in Table (8).

Table (8) Table of specifications for the test

total %100	Evalua tion %4	Installa tion %4	analyze %8	applicati on %21	Accommo dating %31	Knowled %35 ge	Content weight	Number of shares	the classroom
15	1	1	1	3	4	5	%36	18	Fifth
15	1	1	1	3	4	5	%34	17	sixth
10	□	□	□	2	4	4	%30	15	Seventh
40	2	2	2	8	12	14	%100	50	Total

Formulation of test paragraphs
The subjects were selected (objective and analytical) as they were related to
the behavioral purposes identified by Bloom levels in the six cognitive
journals (memorization, understanding, application, analysis, composition,
calendar) Appendix (A-10) (Dulaimi and Adnan, 2002: 44). The answer to this
question is not to be confused with the language of the student or the organiza-
tion of the answer, as well as the duration of the answer to the short question.
The degree of honesty and persistence is high in terms of the comprehensive-
ness of the questions. Degree in case of re-testing the same to students They
can help students to organize their ideas and help them to acquire a good habit
of reading and preparing for the test and encourage them to analyze and
summarize what they are saying (Azzawi, 2008: 40).) This is consistent with
the level of the research sample.
Believe the test
Virtual Honesty: To verify this honesty, the researchers presented the test
paragraphs with the answer instructions and the correct key to a group of
arbitrators (1) to judge the apparent honesty of the test and to modify it accor-
ding to their opinions.
TRUY CONTENT: The two teams prepared a table of specifications to verify
the test and to ensure that the contents of the course content and behavioral
objectives are represented. The test is honest in terms of content.
Preparation of the test instructions: The instructions for answering the test
paragraphs were formulated. They included information about the students, the
purpose of the test and the number of paragraphs, the failure to choose more
than one answer to the paragraph, and the use of accompanying papers in case
of need for drafts to solve the questions (Appendix A-10).

To assess the clarity of the test paragraphs and their understanding and clarity of answer instructions, the test was applied to a sample of (30) female students of the first grade of the Badr secondary secondary school affiliated to the Directorate of the second Rusafa, and after agreement with the school administration and the school of material on The test was conducted after the completion of the classes specified in the mathematics book. On Sunday, April 23, 2017, the exam date was set, and the students reached the test date (7) days before the scheduled time.By calculating the average time as follows:

The answer time of the first two students (40,43) minutes

Another answer time is two students (52.57) minutes

Average time = 52 + 57 + 43 + 40 = 192 192 4 = 48 minutes

All the test paragraphs were clear and understandable to them as nothing was asked during the test period.

10. The second experimental application: After the researcher confirmed the clarity of the test paragraphs and instructions in its initial form, the test was re-applied to the second survey sample (to verify the cykometric characteristics of the test). The sample consists of (100) female students of the intermediate school of Baghdad / The first was chosen randomly (by lot) among the schools of this Directorate, as it was agreed with the school material in the school to apply the test to the students of the first grade intermediate who completed the chapters of mathematics book to be taught and after the students were informed a week before the test date T for the purpose of grooming the exam application was supervised by the same researcher on Monday 04/24/2017.

11. Correcting the test: It is intended to establish a score that represents the response of the students to the test. The correction key (0,1) has been adopted for multiple choice questions, and scores are distributed on the number of steps to solve in the case of essay questions. This is the highest score for the test (57), and the lowest score is (0). After the correction of the test, the researcher arranged the grades in descending order, then took the highest 27% of the students 'answers to represent the upper group and the lowest 27% of the students' responses to represent the lower group (return, 1998: 286).

12. Statistical analysis of the paragraphs: The purpose of the analysis of the paragraphs of the test is to detect the weak paragraphs and work to reformulate, or delete, and the exclusion of the invalid ones, and statistical analysis helps the test maker to ensure that the paragraphs take into account individual differences among students in terms of plains and difficulties and ability On the distinction between students with high capacity and students with weak abilities, and after the application of the test on the second survey sample was conducted the following statistics:

A - Ease and difficulty coefficient Paragraphs: The law applied to the difficulty of the substantive paragraphs of the test and found that it ranges from 0,30-0.59). Then the application of the coefficient of difficulty of the articular paragraphs ranged between 0,42-0,70). Therefore, it is good, Appendix (13), since any paragraph with a difficulty coefficient between 0.80-0.20 is acceptable as indicated by the mechanism of return (return, 297: 1998) .

(B) Discrimination of Test Items:

When calculating the discriminating force of the objective paragraphs of the test, it was found to range from 0.22 to 0.48 and the host clauses ranged from 0,22-0.33 to 13 and since the paragraph less than 0.20 is considered Weak and advised to delete them. (Return, 1998: 295), so the paragraphs of the test are acceptable in terms of their discriminatory capacity and did not delete any of them.

Effectiveness of Distractors:

The equation of the effectiveness of the wrong alternatives was used for all the test paragraphs. It was found that the coefficients of the effectiveness of the wrong alternatives were negative, since any of these distributions were chosen by the higher class students, lower than those in the lower class (Dulaimi and Adnan, 2002) .

D. Validity: Stability is an important feature to be tested. Gauge or test scores are constant if the measurement or test measures a particular attribute in a consistent measure in different circumstances that may lead to measurement errors. (Allam, 89: 2006)

(0.81), which is a good and high stability coefficient for non-standard tests. The test is good if it has a stability coefficient of 0.67 and above. (Hedges, 1966: 22)

Second: Test the levels of understanding of mathematics The tests of the levels of understanding of mathematics were prepared according to the following steps:

1 Setting the goal of the test Goal limiting of the Test:

The objective of the test is to influence Karen's model in developing levels of understanding of mathematics among first-grade students.

2. Limiting Content Test

The researcher adopted the levels explained by Perry and Kieren (2003: 143) where the components measured by the test identified the eight levels of understanding in mathematics.

3. Determining the scientific subject: Mathematics book for first grade intermediate / part 2 / edition 1 / year (2016) of the three chapters (Chapter 5: Geometry, Chapter 6: Measurement, Area and Volume, Chapter 7: Statistics

and Probability (Statistics and Prpbability.

4. Determining the number of test paragraphs: The test paragraphs were prepared in the light of the above levels, and after reading the previous literature close to the current research, such as the study (Al-Aqbi, 2002, Shara, 2006 and Abu Ara, 2014), and after listening to the views of the supervisor The number of appropriate subjects to test comprehension levels was determined in light of the number of main and sub-concepts identified under study, taking into account the capacities of the students at this age and the time allocated for teaching and the content of the modules of the book covered. Measured by eight levels Thus, the number of basic concepts (18) was a total of 144 (1) (144) (1). The first five question levels were objective, multi-choice type, and the last three classification levels, Supplement (A-13).

5. The wording of the test paragraphs: The test paragraphs were formulated in a clear and comprehensible language for all students. Each paragraph expresses a problem related to a particular level. Each test paragraph expresses a problem that includes the necessary information that enables the students to answer at the current level to help them move to the second level Successfully.

7. Certification of the test:

• Authentic honesty: To verify this honesty, the test paragraphs were presented with the instructions of the answer and a corrective key on a group of specialists to judge the apparent honesty of the test and was modified according to their views.

• Content validation: The validity of the content was verified by analyzing the scientific material of the research and extracting the main concepts and subsections (8). It was presented to a group of specialists in the teaching methods of mathematics and some teachers. Therefore, the validity of the content has been fully realized.

7. The first test application: To ensure the clarity of the test instructions, the diagnosis of obscure or unclear passages in the print or the double understanding of any of the test paragraphs, and the time required to answer the test, the test was carried out on the first survey sample consisting of (50) The first, on Monday, February 20, 2017, was randomly selected from the Badr secondary school under the Directorate of Education of Baghdad / Rusafa II. After applying the test, it was found that the time taken to answer each part of the test was 61 minutes, The average time it took To answer the paragraphs of each part of the test.

8. The second survey application: The test was applied to the second survey sample (to verify the cytometric characteristics of the test). The sample consists of (120) female students from the middle school of education of Baghdad / Wednesday, 22 February 2017 Part II.

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9. Statistical analysis of test paragraphs:

The difficulty factor of the paragraphs: The coefficient of difficulty coefficient was applied to the objective paragraphs of the test. It was found that it ranged from 0.22 to 0.69.), Since any paragraph with a difficulty coefficient between 0.20 and 0.80 is acceptable, as indicated by the return mechanism.

B - coefficient of discrimination of paragraphs: The equation was applied to calculate the strength of discrimination of paragraphs found that the strength of the distinction of the substantive paragraphs of the test range from 0,21-0.56) and paragraphs of the range ranging from (0.78-0,21) Annex (13), and The vertebrae are acceptable if the strength of their characteristic is higher than (0.20) (Agelie et al., 2001: 70).

C) Effectiveness of the wrong alternatives: The efficiency of each wrong alternative and each experimental paragraph of the test paragraphs was calculated using the equation of the effectiveness of the alternatives. It was found that the coefficients of all the alternatives were negative, bringing the largest number of students of the lower group compared to the students of the upper group.

D - Stability of the test: Since the test levels of understanding includes the paragraphs of the answer to the answers (0,1) and the paragraphs of the answer rate is divided by the number of steps of the solution so the researcher used the equation (alpha-Kronbach) And the objectivity at the same time (Allam, 2002: 165), the value of which is 0.86, which is a good and high stability coefficient for the unqualified tests. The test is good if it has a stability coefficient of 0.65 and more (return, 1996: 366). Based on the above, all the test paragraphs have been retained and ready to be applied to the sample.

Sixth: Statistical Means: The appropriate statistical means of research were used.

: (1-4) View Results (Presentation of the Results):

The first objective: (Effect of Karin model in the collection of mathematics for students in the first grade intermediate). To achieve this goal, the following hypothesis was formulated:

(1-4-4) The first hypothesis: It states that (There is no statistically significant difference at the level of significance (0.05) between the average score of the students of the experimental group who studied according to the Karen model and the average scores of the students of the control group who studied according to the usual method Collection test).

Table (10) Results of the T-test of the difference between the average scores of the two groups in the achievement test.

Statistical significance	Level of significance	Degree of free	VALUE T		standard deviation	SMA	N O	the group
			calculate	table				
function	0.05	84	4.495	1.990	7.393	41.32 6	46	Experimental
					7.092	34.27 5	40	Control

Table (13) shows that the performance of female students in the experimental group, who studied according to the Karen model, exceeds the performance of the students of the control group who studied according to the usual method in the achievement test, thus rejecting this hypothesis and accepting the alternative hypothesis.

The second objective: (the effect of the Karen model in developing the level of understanding of mathematics among first grade students is average). To achieve this goal, the following hypotheses were formulated:

To assess the clarity of the test paragraphs and their understanding and clarity Table (13) shows that the performance of female students in the experimental group, who studied according to the Karen model, exceeds the performance of the students of the control group who studied according to the usual method in the achievement test, thus rejecting this hypothesis and accepting the alternative hypothesis.

The second objective: (the effect of the Karen model in developing the level of understanding of mathematics among first grade students is average). To achieve this goal, the following hypotheses were formulated:

(2-1-4) The second hypothesis: There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who studied according to the Karen model and the average score of the control group who studied according to the usual method in the test Each of the eight levels of understanding: (primitive knowledge, shape making, shape acquisition, property observation, generalization, observation understanding, construction structure, and invention).

Table (11)
ANCOVA ANALYSIS ANALYSIS OF THE TEST AND TEST GROUPS IN THE TEST OF THE 8 LEVEL APPROACHES "Testing the levels of tribal understanding is the associated variable"

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Note from Table (21) that the value of η2 is (0.194) and the value of d is 1.092. This means that the magnitude of the effect is very large, indicating that the independent variable (Karen model) has a significant effect on the dependent variable The experimental group.

Table (19) shows the results obtained by the researcher to find the effect of the independent variable (Karen model) on the dependent variable (understanding levels).

Table (19) The scale of the effect of the independent variable (Karen model) on the dependent variable (understanding levels) and each of its eight levels

Effect size	d value	η2 value	the field
Large	0.981	0.194	level one
Large	0.927	0.177	Second Level
very big	1.692	0.272	The third level
very big	1.438	0.341	fourth level
very big	1.579	0.303	level five
very big	1.692	0.272	Level 6
very big	1.699	0.327	Level VII
very big	2.267	0.425	Level Eight
very big	1.487	0.356	Levels of understanding

The value of η2 is 0.356 and the value of d is 1.487. This means that the magnitude of the effect is very large, indicating that the independent variable (Karen model) has a significant effect on the dependent variable (understanding levels) Effectiveness on the experimental group and at each level of understanding (primitive knowledge, shape formation, shape acquisition, characteristic observation, generalization, observation understanding, construct structure, invention). The independent variable Karen model has an impact on each level of understanding.

: (3-4) interpretation results (Results interpretation):

(1-3-4) Interpretation of the results related to the first hypothesis concerning the achievement in mathematics:

The results presented in Table (13) showed that the students of the experimental group who studied according to the Karen model exceeded the students of the control group who studied according to the usual method of achievement. The reason is that teaching according to the Karen model helped the students to connect the concepts The result is consistent with the results of previous studies such as (Ja'ad, 2014) and Ahmed (2016). The results of these studies are consistent with the results of the previous studies.), Which showed Above the learners who studied according to the Karen model compared to the usual method of achievement.

(2.3.4) Explain the results of the second hypothesis concerning the levels of understanding between the experimental group and the control:

The results presented in Tables 14 and 15 show that the experimental group of girls studying the Karen model is superior to the students of the control group who studied according to the usual method of understanding levels as a whole and each of its eight levels. The researcher believes that this superiority may be due to the following reasons:

1. The relevance of the Karen model (for levels of understanding) in terms of consistency of each step of the model with each level of understanding in a sequential, coherent and gradual manner that may develop their understanding of mathematical concepts more broadly.

2. The steps of Karen's model, especially the individual calendar, stimulated students to learn independently and take responsibility, and allowed them to learn the subject according to their speed and ability, thereby enhancing their self-confidence and increasing their participation in classroom activities.

3. Using the Karen model in mathematics The students of the research sample were able to develop each level of understanding by developing their ability to form a series of logical ideas and structured conclusions at each level of understanding.

(3.3.4) Explain the results of the third hypothesis concerning the levels of understanding (pre-post) of the experimental group:

The results presented in tables 16 and 17 show that the experimental group of students in the experimental group are more proficient in testing the levels of post-understanding of the students of the same experimental group in the pre-test and at each level of understanding (primitive knowledge, shape making, shape ownership, property observation, , Understanding the observation, the constructive structure, the invention). This is because if we follow the steps of the Karen model, we find that there is a relationship between the

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model and the levels of understanding from the first step to the last step. It is almost intertwined with each level of understanding, Organizing concepts from the top To the bottom, the first level corresponds to "primitive knowledge," since students at first do not have the conceptual map of concepts and when presented with this step they are able to sort out their ideas and recall previous concepts that have to do with the concept of interpretation in a related way. "Making the form" and "observation of the property" as the students begin sorting and distinguishing between the characteristics that show the example and giving explanations and reasons for the non-existent examples makes the students the level of "understanding of observation" and "constructive structure" and enrich the model with real-life exercises and work Competition increases the curiosity and desire to discover up to the creativity and innovation stage.

(4.3.4) Explain the results of the fourth hypothesis concerning the levels of understanding (pre-post) of the control group:

 The results presented in tables 18 and 19 show that the students of the control group are more likely than students of the same group to test the levels of post-understanding of the group's students themselves in the test of tribal understanding levels, and may be attributed to a number of reasons, The duration of application of the experiment by subtracting the scientific material even in the usual way, but enabled the students of the control group to increase their knowledge.

(4-4): Conclusions: In the light of the conclusions reached, the following can be inferred:

1. The students of the experimental group who studied according to the Karen model surpassed the students of the control group who studied according to the usual method of collection.

2. The steps of the model have helped to raise the levels of understanding and development of mathematics among students in the experimental group.

: (5-4) Recommendations (Recommendations):

1. Using Karen's model in teaching concepts that are the mainstay of the components of mathematical knowledge.

2. Attention to teaching models that contain a number of methods based on theories, and to observe the extent to which they can be taught in mathematics.

3. Pay attention to the application processes and increase the functional examples of the social environment of female students and close to reality, so that they become entrenched in their minds and make them interact with them.

4. To identify the levels of understanding possessed by students and develop them using teaching models and appropriate means through educational institutions such as schools.

: (6-4) Suggestions: To supplement the current research, the researcher suggests the following:

1. Conduct a similar study for students and at the same stage to find out the results for the gender variable.

2. Conduct studies and research similar to the current research in other stages of study.

3. Conducting studies similar to the current research of other variables such as (acquisition and retention of mathematical concepts, modification of the misconception of mathematical concepts).

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