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The Effect Of Using Pirie And Kieran's Model To Acquire Concepts At The First Year Intermediate Female Students In Mathematics

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Specialization methods of teaching mathematics / University of Mustansiriya / College of Basic Education

Abstract

The research sample consisted of (54) female students of the first grade average, for the second semester of the academic year (2019-2018) m, Masra Rasoul Girls School of the Directorate of Education first Rusafa in Baghdad was chosen intentionally, by (28) students in the experimental group The two groups were rewarded in the following variables (intelligence, chronological age, previous information in mathematics, previous mathematics achievement, and educational level of parents).

El Efecto De Usar El Modelo De Pirie Y Kieran Para Adquirir Conceptos En El Primer Año De Las Estudiantes Intermedias De Matemáticas

Resumen:

La muestra de investigación consistió en (54) alumnas del promedio de primer grado, para el segundo semestre del año académico (2019-2018) m, la Escuela Masra Rasoul Girls de la Dirección de Educación primera Rusafa en Bagdad fue elegida intencionalmente por (28) estudiantes en el grupo experimental Los dos grupos fueron recompensados en las siguientes variables (inteligencia, edad cronológica, información previa en matemáticas, logros matemáticos anteriores y nivel educativo de los padres).

To verify this, the following zero assumptions were formulated:
1 - There is no statistically significant difference at the level of significance (0.05) between the percentages of students who will acquire the mathematical concepts of the experimental and control groups in the test of acquiring mathematical concepts.
2 - There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who will be studied according to Perry and Keren model and the average scores of the students of the control group who will be studied according to the normal method in the test of acquiring mathematical concepts.

The research tool has been prepared, namely: Test the acquisition of mathematical concepts according to three levels of each concept (definition of the concept, the concept of discrimination, and the application of the concept) consisting of (51) paragraphs (multiple choice) by (17) main mathematical concepts for each concept Three paragraphs according to the levels of conceptual acquisition. Using the equation KR-20) the value of the coefficient of stability was 0.80.

The experiment was applied to the research sample in the second course of the academic year (2018-2019), where the experimental group studied the research according to the Perry and Kirin model while the control group studied according to the usual method, where the test of acquiring mathematical concepts was applied to the research groups and after data

collection and use Appropriate statistical means, the search results were as follows:

1 - The experimental group students who studied using the Perry and Kirin model in the test of acquiring mathematical concepts over the control group students who studied in the usual way, where the excellence in (16) out of (17) concept of statistical significance.

2- The experimental group students who studied according to Perry and Keren model surpassed the students of the control group who studied according to the usual method of testing the acquisition of mathematical concepts.

In the light of the results of the research recommends the researcher to work on the training of teaching staff in secondary schools to use the Perry-Kirin model in the teaching of mathematics and focus on the higher levels of the model and give applications and activities that support the eight levels of Perry-Kirin model, and suggests studying the impact of Perry-Kirin model on other variables such as intelligence Multiple, critical thinking, and systemic thinking.

Research problem

The researcher noted by reviewing the results of many previous studies and research in the field of teaching mathematics such as (Mayouf, 1999) and (Hussein, 2014) and (Jassim, 2016) etc. There is a weakness in the acquisition of mathematical concepts, which may be due to the reasons The following:

1. Lack of importance given to mathematical concepts by teachers.

2- The student does not take responsibility towards the educational material.

3 - low level of general care among the student.

4 - the large number of students within the classroom, which leads to the difficulty of classroom management by the teacher, which affects the acquisition of mathematical concepts.

5 - Teaching methods followed by teachers that focus on memorization and memorization, and make the student recipient of information and not to give him any role in the educational process, which leads to poor acquisition of mathematical concepts.

6 - weak ability of the student to understand the properties of the concept, which leads to confusion between the concepts and the wrong use of them in different mathematical situations.

This was supported by the researcher to send a questionnaire to a group of teachers and teachers of mathematics in the middle stage, includ-

ing two questions about the weakness in the acquisition of mathematical concepts and their answers were as follows:
(93%) of the sample of teachers confirmed that the weakness of students in the acquisition of mathematical concepts due to the reasons
A - the way teachers explain the mathematical concepts
B - the abundance of mathematical concepts within the textbook
C - Continuous change of the textbooks of mathematics
The educational environment that affects the concentration of students

Hence the need to use some models that adopt the method of understanding, including the model (Perry and Kirin), which we try through the experiment to help students to build their mathematical concepts through mental processes practiced by them when applying this model,

Based on the above, the problem of research can be taken by asking the following:
(What is the effect of using Perry and Kirin model in acquiring concepts among first graders average)

Research Importance

The current research acquires the importance of the importance of mathematics and the importance of Perry and Kirin model as follows:
1 - The current research derives its importance from the importance of the variables dealt with, namely the impact of the model Perry and Kirin in the acquisition of mathematical concepts.
2 - The current research is in line with modern educational trends in the teaching of mathematics as the Perry and Kirin model represents one of these trends.
3. Allows researchers to conduct a study on the impact of the Perry-Kirin model on future studies.
4 - The results of this research may draw the attention of officials in the Ministry of Education on the preparation of training courses for teachers on the model Perry and Kirin.
5 - the importance of the intermediate stage, which is a transitional stage of the primary stage, where the transition from the perceptions to the abstract concepts, which is one of the most appropriate stages in which the behavior of the student is formed.

Research Objective

The present research aims to identify the impact of the Perry and Kirin model in:

Acquisition of mathematical concepts among first grade students average.

Research Hypothesis

To verify the research objective, the following null hypotheses were made:

1. There is no statistically significant difference at the level of significance (0.05) between the percentages of students who will acquire the mathematical concepts of the experimental and control groups in the mathematical concepts acquisition test.
2. There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who will be studied according to the Perry and Kirin model and the average scores of the students of the control group who will study according to the normal method of testing the acquisition of mathematical concepts.

Limits Research

1- Spatial Boundaries: Masra Al Rasoul Girls School of Baghdad Directorate of Education / Rusafa I.

2 - time limits: the second semester of the academic year (2018-2019) m

3- Human Frontiers: First grade students average.

4 - Objective limits: Topics of the book of mathematics for the first grade of the middle part 2, edition 2, 2017, which is represented by the chapters (fifth: geometry, sixth: measurement - areas and volumes, seventh: statistics and probability).

5. Levels of mathematical concepts acquisition (concept definition, concept differentiation, concept application)

Definitions of Terms

1.Pirie & Kieren model

(Pirie & kieren, 1994) is a phenomenon of repetition and recurrence, which occurs when thinking moves between the levels of evolution are: (primitive knowledge, form making, owning form, observing property, generalization, understanding of observation, structure (construction), invention), so that each level Be part of the level that precedes it or its content.

pirie & kieren, 1994: 143))

Procedural Definition: It is the process of understanding mathematics through eight gradient levels (primitive knowledge, form making, shape ownership, observation of property, understanding of formulation (generalization), understanding of observation, structure (construction), and invention) by allowing class students The first is the average transition between these levels when they have the required information for each level.

2- Concept of mathematic

Arafa (Abu Zeina, 2010) "mental construction or abstraction of the

mind, ie, the mental image that is formed by the individual as a result of generalizing the qualities, characteristics and conclusions of similar things to things to be exposed later. (Abu Zeina, 221: 2010)

3 - Acquisition of concepts (Acquisition)

Arafa (Badawi, 2003) "The ability of the student to recognize the concept and mention the properties of the concept and the use of the concept in mathematical situations. (Badawi, 64: 2003)

Procedural Definition: The ability of first grade students to identify and distinguish examples of concepts from the examples of concepts and application of mathematical concepts contained in the chapters (fifth: geometry, sixth: measurement - areas and volumes, seventh: statistics and probability) The student gets in the test of the acquisition of mathematical concepts at three levels (definition, discrimination, application) prepared for this purpose by the researcher.

Theoretical framework (literature review)

Pirie and Kieren model

Originally designed as a perspective to study the changing mathematical ideas of students, the Perry-Kirin model provides a framework for mapping students' actions in a variety of contexts to track movement back and forth between eight levels of understanding (primitive knowledge, shape-making, shape-possessing, and property observation, Understanding drafting, observation, synthesis, and invention within these activities learners build, research, and gather ideas.
(Droujkova, 2005: 290)

Each of the eight levels will be illustrated as follows:

Primitive Knowing: It is the essence of the model and represents the deepest level in the model, is all the information brought to the educational position by the learner, which is assumed that the learner exists for a particular subject when it is to be taught. For example, when introducing the concept of the cube, the school can Expect a number of answers that may or may not be correct.

2. Making the image Image Making: At this level lies the ability of the learner to put differences based on his previous knowledge, and these forms are not necessarily (symbols representations of the pictures), but they carry the meaning of any kind of mental forms.

At this level, the school introduces the concept of the cube with two or more concepts, and then asks students to refer to the concept of the cube, clarifying what distinguishes this concept from the rest of the concepts,

and in the case of the inability to answer verbally, the answer can be provided by describing the concept by reference or movements or Drawing on the blackboard.

3. Having shape Image Having: The learner has a shape in his mind so that the development of mental images (mental) more accurately, that is, mathematics will free the learner from the need to perform certain physical actions, where he can distinguish the obvious characteristics of the mathematical forms examined.

After students learn about the concept of the cube, and distinguish it from other engineering concepts, they can now have the shape of the concept, as the school presents several forms of engineering concepts, including the concept of the cube and ask them to choose the shape that represents the cube and if they are the right choice they can Move to the next level.

4. Notice the property property Noticing: Here the learner can examine the shape, and identify the various qualities associated with this form with the observation of the internal characteristics of the shape. After students have the shape of the concept of the cube it became easy to know and note the characteristics of the concept that distinguishes it from other mathematical concepts.

5. Understanding formalizing: At this level, the learner generalizes a particular characteristic from a previous image based on what he has observed. This means that at this level, the student can extract the common characteristic and generalize it to new situations similar to the original position.

At this level, life situations are presented from the reality of the students related to the concept of the cube such as the cube of rubik and ice cubes, thus it becomes possible for students to generalize many cases about this concept.

6. Understanding Observing: At this level, the learner can produce verbal expressions of perception from the concept formed after he is able to observe, build, and organize his own intellectual processes, so that he can interpret the interrelationships and explain them through an intuitive system.

After the students have gained a comprehensive understanding of the evolution of learning the concept, the school can give them no example of the concept of the cube and ask them to answer so they will be able to explain and explain the reasons that it does not represent the concept of the cube, and then move to the top level.

7. Structuring: At this level the learner begins to see the relationships between different topics, and puts certain questions about the ideas, facts and examples that underlie them, and connects these underlying ideas across

many areas, and recognizes the interdependence of several theories.
At this level, as the school presents a question to the students about the relationship between the shape of the cube and the shape of the quadrilateral pyramid, they will begin to see the relationships between the two concepts by thinking properly and then come to the special clues of each concept, which leads to the discovery of the relationship.
8. Invention Invention: The ability of the learner to have a large structural structure for a particular concept that rid him of the mistakes of previous concepts, and constitute questions lead him to develop a new concept. The use of the invention at this level does not mean that the learner can not invent at other levels lower, but used to indicate the ability to break free from the construction of knowledge, and create new questions, which in turn leads to the development of a new concept, and therefore the mathematical understanding at this level is Unspecified and imaginative as it reaches beyond the current construction to ponder the question of "what if?" This question results in the learner's use of cognitive structure as if the first level (primitive knowledge) when investigating beyond the first field of discovery.
At this level, the school asks its students to identify all the cubic schemes they can get. During questions they may reach the correct answer or may not.
David E. Meel, 2003: 143-146)

The following figure shows the eight levels of understanding of Perry and Kirin

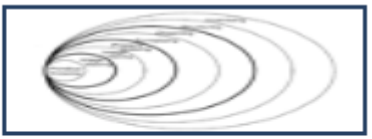

Figure 1

Mathematical understanding levels of Perry and Kirin

(David E. Meel, 2003: 144)

Cognitive Structure in the Perry and Kirin Model:

The Perry-Kirin model originally has an inherent dynamic structure that is evident in many components. In particular, the core of the model is 'primitive knowledge' which has basic dynamic quality.
Perry and Keren (1990) point out that "the obvious significance of this

model is that external levels are continuously growing from internal levels, external levels buried and enveloped internal levels."

Perry and Kirin developed a model based on an inner nucleus known as primitive knowledge, such as the process of building the nest in the form of a circle interconnected with each other and in the form of layers (Fig. 2). The information contained in the inner nucleus is because it determines the learner's knowledge and understanding in the outer layers (Kieren, 1989: 146) (pirie), ie it helps the learner to restrictively understand a concept or may hinder the learner from understanding.

One of the main features of the Perry and Kirin model is the repeated and reverse structure. This process is called folding back, which means returning from one level of understanding to another level of understanding before, for example, when the learner has difficulty at any level of Altmanh while solving a mathematical problem, it needs to return to a previous level of understanding in order to expand understanding Adequate.

The process of folding back is a mental activity by the learner to enter and refer to the primitive knowledge and internal layers in order to build a mathematical understanding at the level of external thinking, and the process of reverse folding is part of the process of re-learning the mathematical learner and occur frequently.

This means that mental activity does not go in one direction, and that the learner who works his thinking in a particular layer or external level, it continues to return to the internal levels in order to expand his mathematical understanding of a particular topic.

Martin, 2005: 22))

Limits of Perry and Kirin model levels:

The boundaries of the Perry and Kirin model levels indicate that the learner moves to a more elaborate and stable understanding, not necessarily that it requires lower-level elements, for example, when the student moves to the level of shape ownership, the examples are no longer necessarily extracted from the form-making level or elements of primitive knowledge. Pirie and Kieren, 1992).

The first term: there may be no need to have a boundary between the levels of "making shape" and "owning the shape." When a person is provided with a picture of a mathematical idea that does not need activities or processes of image formation again, for example, when the student has a mental image such as the idea of polygons will stop using Tools concretely.

The second term: there may be no need to have a boundary between "observation of property" and "generalization" since a person who has a math-

ematical idea (generalization) does not need a mental image resulting from observing the property, for example a student is able to think about the types of polygons without returning to the concept The actual polygon and note its properties.

The third term may not be necessary to have a boundary between the process of 'understanding of observation' and 'composition' since a person with mathematical structures resulting from the structure does not need the meaning that exists at this level at any internal level. For example, a student is able to explain and interpret forms that do not represent polygons. Without reference to what the polygon actually represents.

However, overcoming the limits of no need does not mean that the learner may not move back to this minimum level of understanding. In fact, the limits of no need are crossed during the reverse folding process for reorganization and usually the construction of lower level concepts in order to broaden the understanding of the external level. .

David E. Meel, 2003: 150))

Mathematical Concepts

Mathematical concepts are the basic building blocks and pillars upon which knowledge is built. Principles, laws and theories are a relationship between concepts and represent the main structure of mathematical construction, and the study of the knowledge structure of any mathematical topic begins by clarifying the concepts that are developed and appropriate teaching methods (Obaid et al. .

Types of Mathematical Concepts: Types of Mathematics Concepts

1- According to their belonging to the group assigned

(A) Individual concepts: Concepts that are assigned to a single group, such as the concept of number 7, approximate ratio, point of origin.

B - General Concepts: The concepts that each group has more than one element, such as the concept of a natural number, a negative number, a complex number, a quadratic coupling.

(Abu Zeina, 2010: 225)

2 - Johnson and Rising classification

(A) Concepts related to groups: These concepts are obtained by generalizing the properties of the elements of the concept space. And all his angles lists)

B - concepts high ways of work: These concepts that you get as a result of doing certain steps, for example (multiplication of vectors)

Relationships concepts: These are concepts that focus on comparisons and linkages between group elements, such as concepts ($\geq$, $\neq$).

D - Concepts related to the mathematical structure: These are the concepts of the mathematical structure, such as (the concept of closure).
(Al-Sharif, 32: 1996-33)
Acquisition of Concepts

The task of education is to identify the means and steps to acquire concepts, as the acquisition of concepts reduces the need for further learning or re-learning (Fahd, 2012: 124).

The process of acquiring concepts helps the learner to deal with things and attitudes on the basis of common characteristics between them and the realization of their own characteristics and to come up with a phrase that defines the concept and develop new meanings in similar situations (Zubaidi, 1993: 220).

Some of the models acquire concepts
The most important models developed by specialists to measure the acquisition of concepts
1- Model (bruner)
Name of concept
(B) Examples belonging or not belonging
C- Intrinsic and non-essential features
The distinctive value of the concept
Definition of the concept
(Drunk, 26: 2000)

2- (Merhi and Ahmad, 2005)
It gives examples of the concept and no examples of the concept
Distinguish similar concepts
Formulate the definition of the concept
The concept is applied
(Merhi and Ahmad, 2005: 215)
3. (Badawi, 2003)
Identify the concept
B - the characteristics of the concept
Using the concept
(Al-Badawi, 64: 2003)
After reviewing the classifications and models of acquiring concepts, Badawi (2003) adopted a classification in the preparation of the mathematical concepts acquisition test to suit the research procedures, and after consulting a group of specialists and their agreement that the acquisition of

mathematical concepts is measured at three levels.
1. Definition of the concept
2. Distinguish the concept
3. Application of the concept

Previous studies))
First: Studies on the Perry and Kirin model
• Study (Khatib, 2016)
This study was conducted in Jordan. The purpose of this study was to investigate the effect of using Perry and Kirin model of mathematical understanding in logical reasoning and reduce the cognitive burden of seventh grade students in Jordan. The researcher used the semi-experimental method and the research sample consisted of (64) seventh grade students. They were randomly divided into two groups: an experimental lesson using the Perry-Kirin model for mathematical understanding, a regular-time Dresu officer. Research tools: logical reasoning test, cognitive load test, validation and reliability, teacher training manual using Perry-Kirin model The statistical methods used for multiple analysis of variance. The results related to logical reasoning and skills demonstrated the superiority of the experimental group students who studied using the Perry and Kirin model of mathematical understanding over the control group students who studied in the usual way. The cognitive burden was lower for students who studied using the Perry and Kirin model than for students who studied using the standard method.
• Study (Mizban, 2017)
This study was conducted in Iraq. This study aimed to reveal the effect of Karen model on the achievement and development of levels of understanding of mathematics among middle school students. The researcher followed the experimental method and the research sample consisted of (86) students from the first grade average, where they were divided into two groups: The pilot was studied using the Karen model. Research tools: Achievement test and mathematics comprehension test. The statistical methods used were the T-test. The most important results of the study resulted in the superiority of the experimental group students who studied according to the Karen model over the control group students who studied according to the usual method in the levels of understanding as a whole and each level. The reason is that each step of the model is consistent with each level of understanding sequentially.
Studies dealing with the acquisition of mathematical concepts as a de-

pendent variable

• Study (Obeidi, 2008)

This study was conducted in Iraq. It aimed to identify the impact of the spiral technique and the concept maps strategy on the acquisition of mathematical concepts. The researcher used the experimental method, the research sample consisted of (60) second grade female students in the Institute of Preparation of Teachers distributed in three groups: the first experimental studied in the spiral style, the second experimental studied according to the concept maps strategy, an officer studied according to the usual method, the research tool: test Concept Acquisition A test has been prepared to measure the acquisition of mathematical concepts according to three levels for each concept (distinction, classification, generalization) and the test was applied after the end of the experiment, statistical means: T test. The results indicated that the two experimental groups outperformed the control group after comparing the average scores of the three groups in the acquisition test.

Study (Hussein, 2014)

This study was conducted in Iraq. It aimed to identify the impact of the strategy of reciprocal teaching in the acquisition of mathematical concepts and the attitudes of female students preparing teachers towards mathematics. The researcher used the experimental method, the research sample consisted of (72) third grade female students institutes preparing teachers distributed in two groups: experimental studied according to the strategy of reciprocal teaching, an officer studied according to the usual method, research tool: a test of acquiring concepts was prepared to measure the acquisition of mathematical concepts According to Brunner's Acquisition Classification (knowledge, distinction, application) by four alternatives and a measure of attitudes towards mathematics, statistical means: T test. The results showed that the experimental group was superior to the control group after comparing the average scores of the two groups in the acquisition test.

Aspects of benefit from previous studies:

: (Aspects of the use of previous studies)

1- Deepening the problem and importance of research

2 - Use them in choosing the appropriate experimental design and sample size

3. Identify the levels of the Perry and Kirin model

Preparing the study plan

5 - Access to many books and magazines and international references that

benefit the current study
6 - Preparation of the conceptual acquisition test
7 - Select the appropriate statistical methods that are appropriate to the current study
8 - Use the results of previous studies in the interpretation of the results of the current study

Search procedures
First: Experimental Design:

An experimental design was used for two groups, one experimental, and one control. Mathematics).

Second: Research Population & Sample
Research Population: Determine the research population of the students of the first grade average in the middle and high schools day government of the Directorate General of Education in the province of Baghdad / Rusafa I / for the academic year (2018-2019)
Research sample: Research sample was chosen Masra Messenger for girls intentionally chosen to apply the search experience as the research sample consisted of (54) students

Third: Control Procedures

Research variables were confirmed by parity between the experimental and control groups in some variables (intelligence, chronological age, previous information in mathematics, and previous achievement in mathematics). As shown in Table (1)

Table (1)

Parity of experimental and control groups in variables (chronological age, previous information in mathematics, previous achievement in mathematics)

Significance level	t		Std. Error Mean	Std. Deviation	Mean	The number	Variable	class	The group
	Tabular	Calculated							
not Significant	2.00	0.919	0.63	3.34	155.58	28	Age in months	A	Experimental
			0.75	3.82	154.96	26		B	Control
		0.834	0.40	2.14	9.25	28	previous information	A	Experimental
			0.34	1.72	8.81	26		B	Control
		0.217	3.46	18.33	68.29	28	Prior Achievement	A	Experimental
			3.92	19.96	67.15	26		B	Control

Fourth: Research Accessories:

1- Determination of scientific material: The scientific material was determined according to the content of the syllabus from the mathematics textbook for the first intermediate grade for the classes to be taught during the second semester of the academic year 2018-2019

2 - Identification of concepts: To achieve the goal of the research it was necessary to analyze the scientific material for research and the extraction of concepts where the concepts of the main and sub-concepts were extracted.

3- Behavioral Purposes Formulation: Behavioral objectives are formulated according to merill levels of behavioral goals which include three levels (remember, apply, and discover).

4 - Preparation of teaching plans: The preparation of a set of teaching plans totaled (88) daily teaching plan (44) plans for each of the two research groups.

Fifth: Research Tool

Determining the number of test items

The researcher adopted a classification (Badawi, 2003), which can be measured by three paragraphs for each concept (defining the concept, and distinguish the concept, and the application of the concept) (Badawi, 64: 2003)

The test of acquiring mathematical concepts was prepared in the light of the three levels, and since the number of the main concepts is (17) concepts, the total number of test paragraphs was (51) paragraphs (3 paragraphs) for each main concept. The main concept paragraphs should include sub-concepts. The multiple choice type has four alternatives, one of which is correct.

Validity of the test

Validity Face

The test clauses with the answer instructions and the correction key were presented to a group of specialists to judge the apparent honesty of the test and based on their modified opinions.

Content Validity

The veracity of the content was verified by covering the test all the main and sub concepts in the test.

Statistical Analysis for test items

The test was applied to a sample of (100) first grade intermediate students at the National Unit for Girls

A. Difficulty Coefficient

The difficulty coefficient was calculated and found that its value ranges between (0.74 - 0.24).

Items Discrimination Coefficient:

The discriminatory force was calculated and found to range from (0.56-0.22). Thus, all paragraphs are considered acceptable in terms of their discriminatory capacity and none has been deleted.

Effectiveness of wrong alternatives

The effectiveness of each wrong alternative was calculated and found that the coefficients of all alternatives were negative and thus all alternatives were effective

Test Reliability

According to the stability of the test using the Koder-Richard equation 20 where the coefficient of stability of the test (80%), which is a good and high stability coefficient.

Based on the above, all test items were retained and ready to be applied to the research sample.

Sixth: Application procedures

The experiment began on Sunday 24/2/2019 (5) sessions per week for each group. The experimental group studied based on the eight levels of Perry and Kirin model, while the control group was taught in the usual way. According to the correction method adopted in the research procedures.

Seventh: Statistical methods

T-test for two independent samples (t-test):

2- chi-square test:

3- Equation of difficulty coefficient:

4. Equation of Parameter Marking Coefficient:

5. Equation of the effectiveness of alternatives

6- Equation KR-20

Percent test

8 - Statistical Portfolio of Social Sciences Spss and Excel

Presentation of the Results

1- The first hypothesis: It states that (there is no statistically significant difference at the level of significance (0.05) between the percentage of students who have acquired the mathematical concepts of the experimental and control groups in the test of acquiring mathematical concepts).

To verify the validity of this hypothesis, the answers of the students were corrected and the total score of each student was calculated on each of the concepts. The student is considered to have gained the concept if she answered the three paragraphs of the concept correctly. The three paragraphs

per concept are given zero.

The percentage of female students who acquired the concept from others was calculated. Using the percentage test, the results showed that the experimental group students outperformed the control group students in acquiring (16) out of (17) main concepts (94%). (0.05)

2 - The second hypothesis: It states that (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 Perry and Kirin model and the average scores of the control group who studied according to the usual method of testing the acquisition of mathematical concepts.

To validate this hypothesis, the scores of the experimental and control groups were calculated on the paragraphs of the test of acquiring mathematical concepts. The average score of the experimental group students was (32.79), while the average of the students of the control group (26.23) Using the t-test of two independent samples to determine the significance of the difference between the two groups, the calculated t value was (4.06) which is higher than the tabular value of (2.00) at the level (0.05), which means that there is a statistically significant difference in favor of the experimental group.), Which indicates the superiority of the group students who studied according to the model of Perry and Keren over the students of the control group who studied according to the usual method in the test of acquiring the concepts of sports, and thus reject the zero hypothesis and accept the alternative hypothesis.

Table (2)

Table (2)

The results of the t-test for the mean scores of the two groups in the test of acquiring mathematical concepts

Significance level	t		Std. Error Mean	Std. Deviation	Mean	The number	Class	The group
	Tabular	Calculated						
Significant	2.00	4.06	1.08	5.70	32.79	28	A	Experimental
			1.20	6.15	26.23	26	B	Control

Results interpretation

It is clear from the results of the researcher that the experimental group students who studied using the Perry and Kirin model were superior to the control group students who studied according to the usual method, which came in accordance with the study (Khatib, 2017).

1- The students have different educational practices in each level, such as presenting ideas, discussing, inquiring about them, building them and verifying their validity. This has had an impact on the acquisition of mathematical concepts and the superiority of the experimental group over the control group.

2- The students of the experimental group passed different levels of understanding during their learning from the first level of primitive knowledge to the eighth level of invention, by introducing applications and activities by the school motivated the students to reach the highest levels, which in turn increased their acquisition of mathematical concepts.

3 - Each level passed by the student is characterized by different characteristics of understanding such as the occurrence of reverse folding, and the lack of limits between levels of understanding.

Third: Conclusions

1 - The experimental group students who studied according to Perry and Keren model outweigh the students of the control group who studied according to the usual method of testing the acquisition of mathematical concepts.

2 - The teaching according to the model Perry and Kirin according to sequential steps led to the mental organization of students and thus led to increase their acquisition of mathematical concepts

3- Levels of the model helped the students to identify the mathematical concepts more accurately

Fourth: Recommendations

1- Attention on the part of the authors of mathematics books Perry and Kirin model and try to provide the mathematics book through this model, by giving applications and activities that support the levels of Altman Perry and Kirin model.

2 - Work to train teaching staff in secondary schools to use the Perry and Kirin model in the teaching of mathematics and focus on the higher levels of the model.

Fifth: Suggestions:

1- Conducting comparative studies between Perry and Kirin and other

mathematics models
2 - Study the impact of the Perry and Kirin model on other variables such as multiple intelligences, critical thinking, and systemic thinking.
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