# The Effect of a Cyclic Inquiry Model in Mathematical Proficiency of Second Class  Female Students
# Noor Abdulwahid Al-Rubaiy

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 Abstrac

The objective of the research was to identify the effect of the periodic survey model on the mathematical proficiency of second grade students. The experiment was applied to a sample of 69 students, the experimental group 34 students and the control group (35) For the academic year 2018 (2019), the two groups were rewarded in variables (age of female students calculated by months, IQ test, previous achievement in mathematics, previous math test, mathematical skill test with previous information). The mathematical proficiency test consisted of (23) objective and transitional subjects. The measure of the inclination produced towards mathematics consisted of (30) paragraphs. The validity of the test and the scale were verified. The coefficient of their stability was acceptable , And the coefficient of difficulty and discrimination and the effectiveness of the wrong substitutes for the test paragraphs were good. The coefficient of discrimination for the scales of the inclination produced for mathematics was also good. After the experiment, both the mathematical proficiency test and the inclination measure for mathematics were applied to both groups ). The t-test was used to treat the data. The results of the study showed that there was a statistically significant difference at the level of (0.05) between the average scores of the experimental group and the students of the control group in the mathematical skill as a whole, .

# El efecto de un modelo de investigación cíclica en el dominio matemático de las estudiantes de segunda clase
## Noor Abdulwahid Al-Rubaiy

Resumen

El objetivo de la investigación fue identificar el efecto del modelo de encuesta periódica sobre la competencia matemática de los estudiantes de segundo grado. El experimento se aplicó a una muestra de 69 estudiantes, el grupo experimental 34 estudiantes y el grupo de control (35). Para el año académico 2018 (2019), los dos grupos fueron recompensados en variables (edad de las estudiantes calculadas por meses, prueba de coeficiente intelectual) , logros previos en matemáticas, prueba de matemáticas previa, prueba de habilidad matemática con información previa). La prueba de competencia matemática consistió en (23) asignaturas objetivas y de transición. La medida de la inclinación producida hacia las matemáticas consistió en (30) párrafos. Se verificó la validez de la prueba y la escala. El coeficiente de su estabilidad era aceptable, y el coeficiente de dificultad y discriminación y la efectividad de los sustitutos incorrectos para los párrafos de prueba eran buenos. El coeficiente de discriminación para las escalas de inclinación producidas para las matemáticas también fue bueno. Después del experimento, tanto la prueba de competencia matemática como la medida de inclinación para las matemáticas se aplicaron a ambos grupos). La prueba t se utilizó para tratar los datos. Los resultados del estudio mostraron que hubo una diferencia estadísticamente significativa al nivel de (0.05) entre los puntajes promedio del grupo experimental y los estudiantes del grupo de control en la habilidad matemática en general.

Introduction:

The educational movement in recent years in Iraq witnessed a great change in order to develop and raise the level of learning and education in accordance with the spirit of the times. We note the interest of the Iraqi Ministry of Education in the development of curricula in general and mathematics in particular and its efforts to change them. It is necessary to accompany this development and change in the diversification of methods, models and strategies of training to suit the characteristics of students development and their components and levels of mental and ways of suspense, and push them to search for information, which reflects positively on the process, education As a whole, teaching methods within the classroom are still typical methods of

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non-diversity, which makes students take a rigid form in education as recipients of information, which in turn leads to weakness in the level of sportsmanship of students, both at the school and university levels. This is indicated by the study of (Jassim, 2018) (Al-Obeidi, 2018).

From the experience of the humble researcher in the teaching of mathematics for a period of not less than seven years, I noticed that most of the solutions of the students were characterized by procedural, ie save the steps to solve and apply without solving the problems that have a conceptual understanding or reasoning or strategic efficiency, which is a component of mathematical ingenuity, In order to ensure that there is a weakness in the level of their mathematical proficiency, the researcher presented a questionnaire to the teachers of mathematics in the second grade intermediate to explore their views on the methods they use, and the reasons why the students did not possess the skill of sport. After analyzing the questionnaire, The researcher:

• (80%) of teachers use the usual method only in teaching, which depends on conservation and memorization.

• 100% of teachers do not use the periodic survey form in their teaching.

• 90% of teachers have no knowledge of sportsmanship and do not measure it with their students.

In addition, the scarcity of studies that focused on the mathematical proficiency and promotion or development of students in the second intermediate grade led to the necessity of the researcher to do this research in order to identify the effect of the periodic survey model in improving mathematical skill. The following question:

What is the effect of the periodic survey model on the mathematical proficiency and achievement of second-grade students

In mathematics?

research importance:

Mathematics is a universal instrument that complements the language of nature and expresses the human mind, which reflects many abilities, including practical ability, contemplative power, deductive power, as well as reasoning and desire to reach, aesthetically perfect. Mathematics is the language of science. Others do not complete unless we convert the results into equations and convert the constants to graphic lines. (Natur, 2015: 11). The mathematics curriculum seeks to prepare students for the future better, making them able to make decisions, apply and interpret mathematics in diverse contexts by improving and developing their abilities in life situations involving mathematical concepts or problems Which are in mathematical form; so that they can be solved through full participation with society. (Curriculum Curriculum, 2013: 4). At present,

we need to use modern teaching methods that work in tandem with the mathematics curriculum, in order to provide teachers with a broad, advanced and diverse perspective on the delivery of educational material, Enrich, inform and develop their mental skills, develop their creative skills, and train them to discover or invent something new and different. (Dani, 2017: 5)

In light of the above, it is clear that new approaches, strategies and models should be used in the teaching of mathematics, providing students with positions and educational activities that require them to practice different mental processes. These include inquiry-based learning. )

Parr & Edwards (2004) and 2001 (kolkhorst & et al.) Suggest that the learning environment of the survey confirms that the learner is the most effective element in the learning process, emphasizes the interest in developing, the different learning aspects of the learner, Educational situations in the form of scientific problems, shaped in the form of open-ended questions exciting to the learner's motivation to investigate, as it requires the learner, practicing different thinking skills in an attempt to reach, to appropriate , 2012: 261) Models, educational-based survey, which emphasizes the importance of the learner's positive role, Active in the process of learning, and this role is shown through the use of mental abilities that are available, has during the process of investigation and discovery, and his attempt to solve sports problems, and activities, the process as a researcher of maturity; to practice different methods and methods of science, and use, To scientific results of these activities, such as model models, periodic survey.

Apedoe & Waker & Reeves (2006) and Wee & Sheparolson (2007) note that survey-based learning has many advantages and can be summed up as follows:

• Helping students to understand mathematical concepts, and their applications in new situations.

• Develop the skills of the mathematical investigation, sports theory, and different thinking skills.

• Developing innovative and creative abilities and solving students' problems.

• Raising students' understanding of the nature and history of science.

• Increase students' motivation towards learning when conducting survey activities. (Baali, 2012: 262)

Therefore, the researcher chose the model of the survey, the periodic, because it has the advantages of helping to build knowledge and increase its quintessence, as the student builds his own knowledge and provides the requirements for learning the good and the fruitful and comes commensurate with the middle stage. Mathematics has undergone a number of fundamental transformations in response to changes, cognitive and technological, as well as the awareness of educators of the role played by mathematics in all areas of knowledge. The various reform and development movements differed and emphasized the absorption, thinking, And

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the ability to prove mathematical evidence. This has played a role in the development of the various objectives of school mathematics. Although there is no term that embodies the aspects of experience, competence, knowledge and understanding in mathematics, the term "sports efficiency" To teach and teach mathematics, so learners are supposed to achieve mathematical proficiency in mathematics. (Hassan, 2016: 22)

Learning, with understanding and understanding, is better than learning that depends on remembering and memorizing; it helps to learn about interrelated subjects through the ability to organize them and then retrieve them. The basic idea is the benefit of overlapping different branches with each other. It requires the learner to connect to the parts of knowledge with each other and in an integrated manner, and this link, a key factor in the use of what the learner knows to solve the problems and situations that face him effectively, as well as the importance of procedural fluency in the ability to understand problems and resolve them, It is called a The efficiency of the strategy, which includes the use of conceptual knowledge and procedural fluency in solving these problems, and also contribute to adaptive reasoning which includes justification, interpretation and explanation of the solution, as well as the use of logical reasoning, inductive and integrative, and learning is influenced by the incentive that represents one, the five dimensions, Mathematics. (Kilpatrick et al., 2001: 118), and for the importance of sportsmanship (sports efficiency), Diaz (2006) noted that the United States of America, in 2002, was keen to sign a law obliging it to set specific standards for proficiency Mathematical competence. The law requires that each state in the United States measure the progress of learners in mathematics, from the third grade to the second grade. (Safety, 2014: 5)

Therefore, the researcher believes that the educational system must pay attention to this aspect (the mathematical ingenuity) that is shown in the students, through its discovery, development and development, it may create the learner in his field, and to be able to develop the learner's mental abilities to cope with the various life situations that you may encounter In this context, and with the lack of studies that dealt with this aspect, the current research has been concerned with the mathematical proficiency of second-grade students by experimenting with the periodic survey model in their teaching of mathematics.

Therefore, the importance of the current research can be clarified through:

1) The compatibility of this research with modern educational trends that call for the use of modern models and strategies in the teaching of mathematics, and the periodic survey model is one of the modern models in teaching, which makes the student the focus of the educational process, and this is confirmed by modern education.

2) The importance of the research emphasizes the importance of its subject, as it deals with the concept of mathematical ingenuity as a fundamental goal of achieving success in learning mathematics, which is sought by school mathematics curricula everywhere.

This research focuses on the active and positive role of the student and gives him self-confidence and emphasizes the importance of benefiting from his previous experiences.

4) This research presents daily teaching plans prepared according to the periodic survey form, which may benefit the officials in the preparation of the textbooks in the preparation of the teacher's guide regarding the study stage.

5) This research is an important step that may open the way for researchers to carry out other studies in this field in light of the scarcity of studies that dealt with the periodic survey in the teaching of mathematics in Iraq and Arab countries (to the knowledge of the researcher).

6) Provide middle school teachers with a test of mathematical proficiency and a math-related slope measure that may enable them to learn the level of sophistication of second-graders.

7) The results of this research may draw the attention of the authors of the books of mathematics by employing the dimensions of mathematical ingenuity in the formulation of the content of mathematics books in the middle stage, and not just abstract information.

Search Goal:

The aim of the research is to identify the effect of the periodic survey model on the mathematical proficiency of second grade students.

Search Hypothesis:

For the purpose of verifying the objective of the research, the following zero hypothesis was formulated:

There is no statistically significant difference between the average score of the students of the experimental group who will study, the mathematics according to the periodic survey model and the average score of the group's female students who will study the same subject according to the usual method of mathematical skill as a whole.

Search limits: Search is limited to:

1) students of the second grade intermediate in schools, middle-morning girls for the Directorate General of Education Baghdad / Rusafa II.

2) The content of three chapters of the book of mathematics, to be taught to second-grade students, the first part, the first edition of 2017, which is (Chapter II: the real numbers, Chapter III: determinism, Chapter IV: Equations, and discrepancies).

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3) Dimensions of mathematical ingenuity (conceptual comprehension - procedural fluency - strategic efficiency - adaptive inference - the tendency towards mathematics).

4) The first semester of the academic year (2018-2019) m.

Select search terms:

• Cyclic Inquiry Model:

(Attia, 2016) defined it as a "procedural model of classroom teaching with sequential steps that take a periodic course that starts with questioning, explores, creates ideas and debates, and ends with reflection and asking questions to evaluate what was done during the survey process and the results reached." (Atiya, 2016: 348)

The researcher defines the periodic survey model as an educational model that uses periodic, sequential steps used by the researcher to teach the second grade intermediate students (the experimental group) the mathematics, start by raising their thinking about the educational situation (problem, concept, idea), then ask questions, Solutions, invent new ideas, discuss these ideas, unify them, and finally end up meditating on the results of any previous stages of the model.

• Mathematical Proficiency:

NRC, 2001) defined it as: a term launched by the Mathematical Learning Committee developed by the National Research Council to find out what it means to learn

mathematics successfully; it encompasses all aspects of experience, competence and knowledge in mathematics and has been described in five critical dimensions that operate inseparably and are called in some Literature (dimensions, branches, strands or components of mathematical skill) (conceptual comprehension, procedural fluency, strategic efficiency, adaptive inference, inclination towards mathematics). (: 1152001 (NRC,

The researcher defines the skill, mathematical and practical as: the ability of second-grade students to absorb the concepts, sports and skill in the implementation of the steps accurately and flexibility, through logical thinking, justification and interpretation, and the formulation and representation and resolution of mathematical problems to enable students to see mathematics useful material and important in life Daily, and measured in the final grade, obtained by answering the paragraphs of the test of mathematical excellence in its dimensions, the four which represents the cognitive dimension as well as the answer to the scales of the inclination produced towards the mathematics, which represents the emotional dimension, The purpose of this search.

• Dimensions of sports ingenuity:

NRC (2001) defined it as:

1) Conceptual understanding: understanding of concepts, processes and relationships.

2) procedural fluency: skill in the performance of sports operations with flexibility, accuracy and efficiency.

3) Strategic Competence: The ability to formulate, represent and solve mathematical issues.

4) Inference of Enlightenment: The ability to think logically and intuitively, intuition, interpretation and justification.

5) The tendency towards mathematics: To consider mathematics as realistic, useful and meaningful, and to be taken care of, coupled with the hardness of the person and his diligence and efficiency. (NRC, 2001: 115)

The researcher defines the dimensions of mathematical dexterity as follows:

1) Conceptual comprehension: It is measured by the degree to which the students of the research sample are obtained by answering the conceptual comprehension paragraphs that were prepared according to the indicators of this dimension in the test of mathematical proficiency.

2) procedural fluency: measured by the degree obtained by the students of the research sample by answering the paragraphs of procedural fluency, which was prepared according to the indicators of this dimension in the test of mathematical prowess.

3) Strategic efficiency: measured by the degree obtained by the students of the research sample through the answer to the paragraphs of strategic competence that were prepared according to the indicators of this dimension in the test of sports ingenuity.

4) Adaptive inference: measured by the degree obtained by the students of the research sample by answering the adaptive inference sections that were prepared according to the indicators of this dimension in the test of mathematical ingenuity.

5) The inclination produced towards mathematics: measured by the degree to which the students of the research sample obtained by answering the scales of the inclination scale produced for mathematics prepared for the purpose of the research.

Background Theory:

• Cyclic Inquiry Model:

Is an instructional model developed by Bertram Bruce with his colleagues at the University of Illinois (1996) in the United States of America. He takes a periodic course of learning that begins with questioning and then investigates and then creates or creates ideas, then the discussion of these surveys and ideas ends in Meditation, and the meditation here in the stages that preceded, where the evaluation of what was done in the previous stages of the survey to reach

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the final results, and this model is characterized by focusing on the effects of the mind-educated thinking about the educational situation or concept or the mathematical issue, which raised questions and the creation of innovationTo resolve appropriate to them, and what should be noted that each step of this model are closely associated with the normal sequential incremental step that followed, is based on this model of cooperative learning, students are divided into groups numbering no more than six students. (Bruce & Bishop, 2002: 709) The survey in general and the periodic survey model in particular are based on collaborative teamwork and exchange of ideas among students and help them to reflect on the results they reach. (Olive, 2002: 97)

Stages of periodic survey form:

First, the question is the first stage in the periodic survey model, which is the excitement of students. The teacher presents an educational position, whether it is a mathematical problem or a new question or concept, and presents the main ideas in it. This helps students understand the dimensions of the subject, And ask them to think appropriately and put their ideas and questions that come to their minds and that are related to the problem or the issue at hand, and the question is inspired by the real curiosity of the student, the teacher begins to write these questions on the blackboard and choose them directly related to the subject of the lesson, and presented to them in an attempt to answer about him a. (Atiya, 2016: 349)

Second: Investigate: At this stage the curiosity of students moves to work, and students begin to conduct survey operations and their various skills such as observation, observation, reasoning, information collection, organization, forecasting, analysis, interpretation, formulation and testing of hypotheses in order to gather information that may contribute to answering questions in the stage And they can re-formulate their questions, and refine their surveys and it is possible to reveal a new path was not questioned and added to their questions, this stage is a process centered on the learner, and learning occurs as a result of information processing by the student E, which should be noted that at this stage must give the right time for students when they try to answer the questions, with the codification of all observations and conclusions in the notes for each group book. (Casey et al, 2009: 31)

Third: Innovation - the formation of new ideas Create): Here the students identify the conclusions and highlight the main points they reached in the two phases (question and inquiry), and the integration and employment in generating ideas that contribute to answer the main questions, and each group This course contributes to the development of creative and creative thinking among students and makes their learning meaningful based on structural theory that

emphasizes the construction or formation of knowledge rather than transfer. (Bruce & et al, 2003: 7)

Fourth: Discussion: Here the groups exchange ideas, ideas and solutions among themselves and are discussing the surveys they have reached and the participation of new ideas discovered and innovative with all members of groups and decision-making as well as give evidence and logical explanations of these solutions, and at this stage is determined role To the teacher in the process of learning, as the research of students to share information and conclusions, and encourage them to ask questions and compare ideas and exchange of experiences among them, and guidance on how to put information and modify the formulation of their ideas if they need An active dialogue makes the survey not only a personal involvement but also a collective commitment that provides students with opportunities to share new ideas, while demonstrating  similarities. The differences in their surveys, and helps to develop their views on educational attitudes. (Bruce & lin, 2009: 237)

Fifth: Reflection: At this stage, the teacher gives students time to reflect on what has been achieved in the previous stages, starting with identifying the main questions about the educational situation, the way it was answered using skills and survey activities, ending with the conclusions and ideas, Also determine the relationship between the main questions and the conclusions drawn. This is done through meditation in the previous stages, and to activate the process of reflection of students should be trained by the teacher to self-questioning. (Bruce & et al, 2003: 7)

Al-Baali (2012) adds that students who come to their senses can be asked new questions to be answered and examined through the previous steps of the periodic survey model. (Baali, 2012: 264)

• The concept of sports ingenuity:

Educators recognize that a term does not fully embody all aspects of experience, competence, knowledge and proficiency in mathematics, but they believe that it is necessary for any person to successfully learn mathematics to be proficient and proficient through all aspects of mathematical skill (Bedouin, (Ragan, 2012) as a major goal in mathematics education programs and an introduction to program development by focusing on its components: conceptual comprehension, procedural fluency, strategic efficiency, adaptive inference , The (Hassan, 2016) as a set of processes, thinking skills, attitudes and tendencies that promote learner learning of mathematics. It involves understanding mathematical concepts and implementing procedures flexibly and accurately with the ability to formulate, represent and solve problems, The rationality and expediency of mathematics in practical life (Hassan, 2016: 58).

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In the Arabic language, the names of this term differed between sports efficiency, mathematical skill, and mastery of mathematics. Some called it a mathematical skill such as Mudley, 2008, Masrawah, 2012, Radwan, 2016, Dhani, 2017, , (2017), (2017), (2017), (2017), and others named sports efficiency (Salama, 2014), (Abu Rayaat, 2014) 2012), (Qatami, 2013) have been proficient in mathematics, and it should be noted that all these labels in one sense of the concept of Mathematical Proficiency).

• Dimensions of sports ingenuity:

We have explained above that sports ingenuity has five dimensions or components or branches or strings representing many different aspects, and it should be noted that these dimensions are not independent in themselves, but overlapping and intertwined and interrelated with each other, as the mathematical ingenuity can not be achieved (2010, Figgins) indicates that these five dimensions must be available in an integrated and balanced way for students, (Understanding, skills, abilities and tendencies) during learning Let Them Understand Mathematics (2010, Figgins) These dimensions are:

Conceptual Understanding:

The integrated and functional understanding of mathematical ideas refers to conceptual comprehension. Learners who are conceptualized are beyond their knowledge of the facts, concepts and known methods. They understand the causes and contexts of the formation of the concept or the basic idea; their knowledge is coherently coherent to produce new ideas related to the precedent they know; The facts and methods gained with the understanding of the learners are interconnected and easy to remember and employment and can be reconstructed as they are forgotten, as most teachers are looking for evidence to infer from the understanding of learners, we find them make the capacity of (Radwan, 2016), and see (Radwan, 2016) that education coupled with assimilation makes subsequent learning more likely to be The concept of conceptual comprehension is of great importance in the promotion of mathematical ingenuity, as it makes the learner can represent the concept in more than one way and its ability to employ it in solving various problems (Radwan, 2016: 19)

After studying the educational literature and previous studies, she was able to draw some of the indicators:

 grasping mathematical ideas in terms of mathematical concepts, relationships and processes.

 Translation of the mathematical idea in the field of mathematics and other sciences, both theoretical and applied.

 Rephrase the content of the mathematical idea.

 Find out the correlations between mathematical ideas.

 Student retrieval of previous information.

Second: Procedural Fluency: Procedural Fluency

The procedural fluency refers to the knowledge of the procedures and processes, how to use them appropriately, and lies in the skill of the learner's performance of those procedures with flexibility, accuracy and perfection, and these procedures can develop and solve types and categories of problems and not only individual problems, as the study of algorithms as "procedures General "in making learners acquire a vision of the real mathematics and the extent of its organization and the extent of singing in the patterns as well as predictability. (Bedouin, 2019: 248-249). Procedural fluency enables learners to use mathematics optimally, providing confidence to solve mathematical problems and giving examples to test the validity of their mathematical ideas. (Al-Maatham and Sa'id, 2014: 12). Both NRC, 2001: 122 and Al-Dhani (2016: 47) pointed out that conceptual assimilation and procedural fluency are two overlapping and interrelated dimensions. Conceptual assimilation is related In practice, comprehension makes skill learning easier, less prone to forgetfulness and error, which means that there is a certain level of skill to learn mathematical concepts with their understanding, and the use of procedures can help promote and develop this understanding (Badawi, 2019: 249).

After studying the educational literature and previous studies, she was able to draw some of the indicators:

•       Perform calculations efficiently.

•       Choose the appropriate steps to solve sports problems easily and flexibly.

•       Use more than one way to solve mathematical problems.

•       Skill in carrying out procedures accurately, flexibly and efficiently.

•       Use known formulas to solve unusual mathematical problems.

Third: Strategic Competence Strategic Competence:

Badawi (2019) points out that strategic competence is the learner's ability to formulate, represent and solve mathematical problems (Badawi, 2019: 251). MacGoregor (2013) sees the learner's ability to solve, interpret and formulate mathematical problems, Identify, represent and resolve the information given through appropriate strategic use and reflected in realistic situations of life. (MacGoregor, 2013: 6), while NRC (2001) showed that strategic competence appears to the learner when looking for similar mathematical issues in solution and formulation, identifying useful data and ignoring excess, as well as being able to generate examples and similar issues in the solution. (NRC, 2001: 123). It should be noted that the combination of conceptual comprehension and procedural fluency makes the learner able to solve mathematical problems in order to use them in a practical way. Conceptual understanding helps the

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learner evaluate the type of problem. Fluency The process will be used in the solution with precision and skill. In strategic efficiency, learners will be able to apply their knowledge of mathematics and be able to explain their steps in the solution, and thus be able to  choose the right strategy to solve the problem, as opposed to those who do not have strategic competence. (Maatham and Saeed, 2014: 13)

After studying the educational literature and previous studies, she was able to draw some of the indicators:

Representing sports situations with drawing or shape or any other mathematical representations.

Formulate and resolve mathematical issues.

Find similar issues in solution and formulation.

Distinguish the relevant data and ignore the irrelevant.

Choose the most appropriate procedures to resolve the issue.

IV Adaptive reasoning:

(Al-Masarwa, 2012) defines the ability of the learner to think about mathematical relationships and concepts in a logical way. The learner can show the understanding of mathematics (conceptual comprehension), the possibility of executing its steps (procedural fluency) Adaptive reasoning is not limited to giving explanations and formal justifications, but rather to the ability to guess, intuition and measurement, and make the learner trained to develop his skills above the knowledge and considered one way to convince others. (Jasmine, 2018) suggests that the adaptive inference of the learner requires the ability to think in order to arrive at logical reasoning stemming from logical thinking, as well as the ability to arrive at correct and logical conclusions when solving problems, as well as its ability to justify The reason for reaching these results. (Jassem, 2018: 39)

After studying the educational literature and previous studies, she was able to draw some of the indicators:

•	Employing logical and conceptual thinking about the relationships between mathematical concepts.

•	Provide adequate explanation and justification for the solution.

•	Know how well the facts, concepts and solutions are integrated in a logical way.

•	Using inductive reasoning, intuition.

Fifth: The tendency towards mathematics:

In general, tendencies are one of the most important drivers of human behavior. They are an important indicator of building the personality of the learner.

They have an important role in the process of teaching and learning, so it is the competent teacher who is interested in knowing the tendencies of his student towards the educational material so that he can reach their minds, Which is in turn working to achieve the desired objectives of teaching (Abu Hilal, 2012: 47), and this dimension of the important dimensions indicated by NCTM, 2003)) within the principles of what is important in the learning of all students, both students and without exception able To learn mathematics by understanding, and this understanding is achieved as they have the opportunity to (NRC, 2003: 124), and NRC (2001) points out that the tendency towards mathematics (or productive tendency or inclination produced) is to see the learner of mathematics as a useful and useful material and must be taken care of, as well (NRC, 2001: 131). The tendency towards mathematics refers to one's tendency to see the meaning in mathematics by seeing it as useful, worthwhile, learning, and not arbitrary. , As well as the belief that the constant effort and perseverance in learning mathematics pays off, not the gina (2017: 258). He explained that the above can be achieved when the sports activities provided by the classroom environment, which provide opportunities for students to see mathematics as an understandable subject. And have a meaning and usefulness in everyday life, as well as their realization that success in learning mathematics is done through more effort (Hinnawi, 2018: 385).

After studying the educational literature and previous studies, she was able to draw some of the indicators:

•        The feeling that mathematics is useful, necessary and realistic and must be taken care of.

Recognize that perseverance and diligence of the individual succeeds in mathematics.

previous studies:

First: Previous studies on the periodic survey model:

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| Results | Statistical means | search tools | Size and sex of the sample | Educational level | Study Approach | Purpose of the study | Name of researcher, year and place of study |
|---|---|---|---|---|---|---|---|
| Results performance in the study of mathematics was better than the performance of Darcy students in mathematical culture in understanding some of the chemical concepts included in the topic of "partial | T-test mean for independent samples The Tit test | Sports tools proficiency test Test assimilation of chemical concep | (20) of the student samples )80( | Tenth nal level grade High school students | Appropriate test | Determine the study the growth of mathematical prowess in numerical effectivenes s of using the periodic survey model to absorb some chemical | Marailid, place 2018 Siyuth Africa Lisette & Joop & Albert, 2009 United States of America |
| spread" among high average school students. of educational design on the basis of sports | T-test for two independent sample | Lister mination of measu rement after the mathe matica | ) 80 student s Experi mental (40) student Th | Fourth Scientific | test | To identify the on impact school of educational identify the | Jasem 2018 Iraq |
| of sports efficiency, for the benefit of the experimental group -difference between average effect of research for the learning in the scope of the procedure for the test in biology the experimental group. * There is an | statistically significant sample s t-test)) for one sample | the mathe matica l trend produc ed Collec tion test | officer (40) Students | Fifth Scientific Biochemi stry | test | effect of the learning according to the periodic survey the mathematic al efficiency in the habits achievement of mind and of students athletic efficiency of grade of students in biological the fourth science and | Mohamed Iraq 2017 |
|  |  |  |  |  |  | their systemic thinking |  |

| | | | | | grade scientific |
|---|---|---|---|---|---|
| average impact of educational design _ in the overall sports efficiency, for the benefit of the experimental group. * There is no trace of the design of the education _ learning on the basis of mathematical competence in the habits of the mind of the experimental group | | | | | |

Second: Previous studies dealing with sports ingenuity:

Research Methodology: The researcher used the experimental approach that is appropriate to the research objective and hypothesis.

Search procedures:

First: Experimental Design:

Table (1) / experimental design adopted in the research

| Search Tools | The dependent variable | The independent variable | Variables | Group |
|---|---|---|---|---|
| Mathematical Proficiency Test  The scale of the productive disposition towards mathematics | Mathematical Proficiency | Cyclic Inquiry Model | Age of female student calculated by months.  Intelligence test. | Experimental |
| | | The usual method | Previous achievement in mathematics.  Mathematical knowledge test previous.  Mathematical proficiency test in previous information. | Control |

Brief

Second: Research Community:

The research community is represented by all intermediate secondary school girls in the middle schools for Girls, which is part of the General Directorate for Education Baghdad / Al-Rusafa for the academic year 2018-2019. The total number of middle schools is 41 schools divided into four departments of the Directorate. When the total number of second-grade students was average (11,225).

Third: Research Sample:

The researcher (medium of will for girls) of the Directorate General of Education Baghdad / Rusafa second choice deliberately for the following reasons:

- Cooperation of the school administration and the school of material in facilitating the researcher's task to conduct the experiment.

- The social, cultural and economic aspects of the female students.

- The school is located in the researcher's living area, as well as the official working hours of the morning school.

(C) The experimental group was chosen according to the periodic survey model. The number of female students was (34) female students, and (e) the control group was represented according to the usual method. (35) students, after excluding (2) students from the experimental group and (3) students from the control group because of failure, as the female students have previous experience of the subjects to be taught during the experiment.

Fourth: Control procedures:

• chronological age of the students calculated in months: calculated the old schedule for each student months by relying on proven information in the school card and official records of the school; as the arithmetic average for the age of students in the experimental group (163.62) and a standard deviation of (6.391), while the arithmetic average for the age of the control group (164.63) and a standard deviation of (8.388), and to ensure the homogeneity of the reconstruction of the two contrast, the use of Levin test for two independent samples, reaching the value of Levine (F) calculated (2.087) at the level of significance (0.153) which is greater than the level of significance (0.05), that is, there is no difference Statistical significance between the ages of two sets of search variation, and know the significance difference between the average age of students groups in variable life time in months, was used Altaia test (t-test) for two independent samples, reaching the T value calculated by (0.562) at the level of significance (.576), a (67). This indicates that there is no statistically significant difference between the mean age of the two groups, ie, the two groups are equal in this variable, as shown in Table (2).

• IQ test: Use the DNA test, because it is compatible with the age of the second grade students, the average, as well as its suitability to the Iraqi environment, is characterized by honesty and consistency, and applied to the research groups on Thursday (25/10/2018) the experimental group (21.382) and a standard deviation of (5.527), while the arithmetic average of the grades students control group (21.914) standard deviation of (5.266), and to ensure the homogeneity of differing degrees of the two groups, the use of Levin test for two independent samples, reaching the value of Levine ( F) calculated at (0.006) at an indication level (0.941) which is greater than one level In order to determine the difference between the mean scores of the students of the two groups (experimental and control) in the IQ variable, the t-test was used for two independent samples, (0.409) at the level of significance (0.684), which is greater than the level of significance (0.05) with freedom degree (67), and this indicates that there is no statistically significant difference between the average scores of the two groups, Table (2) shows this.

• Previous achievement in mathematics: Taking the mean of the first and second grades in mathematics for the first grade average, and obtained from the school records of the grades of female students. The mathematical average of the previous

achievement of the students of the experimental group (64.000) and the standard deviation of ( 11,954), while the arithmetic mean of the control group scores (65.486) and a standard deviation of 11,092, and to ensure the homogeneity of the two groups' scores (experimental and control), the Levin test was used for two independent samples, ) At a semantic level (0.944), which is greater than the level of significance (0.05), that is, there is no statistically significant difference between the difference in the scores of the two groups of research. To determine the difference between the average scores of the students of the two groups in the previous collection variable in mathematics, (0.535) at the level of significance (0.594), which is greater than the level of significance (0.05) with freedom degree (67). This indicates that there is no statistically significant difference between the mean scores of the two groups The two experimental groups (experimental and control) are equal in this variable, and Table (2) shows this.

• Test the previous knowledge in mathematics: In order to identify what the students of the two groups (experimental and control) of the previous information in the mathematics related to the sports topics to be included in the research experience, a test was prepared for this purpose consisting of (20) ), Was presented to a number of arbitrators in mathematics and methods of teaching, in order to ascertain the validity and validity of the paragraphs of the test and the accuracy of its formulation, the test is ready for implementation,

after the researcher made some of the amendments based on the recommenda-
tions and opinions of the arbitrators, The experimental average of the previous
test scores in mathematics for the experimental group (9.324) and the standard
deviation of (3.207), while the arithmetic average of the test scores reached
(29/10/2018) The previous knowledge in mathematics for the control group
(9.800) and a standard deviation of (2.324). To verify the homogeneity of the
two groups, the Levin test was used for two independent samples. The calcula-
ted value of (F) was 3.765 at a level of 0.057 (0.05), that is, there is no statisti-
cally significant difference In order to determine the difference between the
mean scores of the two groups (experimental and control) in the previous
knowledge test in mathematics, the t-test was used for two independent
samples. The calculated T value (0.708) was at a level of significance (0,481),
which is greater than the level of significance (0.05) with a degree of freedom
(67), indicating that there is no statistically significant difference between the
average scores of the two groups, that is, the two groups are equal in this varia-
ble.

• To test the mathematical skill of the previous information: For the purpose of
identifying what the students of the two groups of mathematical skill in the
previous information of mathematics related to sports topics that will be inclu-
ded in the research experience in light of the dimensions of mathematical inge-
nuity, a test was prepared for this purpose consisting of (15) paragraphs; (9) An
article presented to a number of arbitrators in mathematics and the methods of
teaching. For the purpose of verifying the validity and validity of the test
paragraphs and the accuracy of their formulation, the test is ready for imple-
mentation, after the researcher conducted some Of the amendments thereto On
the recommendations and opinions of the arbitrators, the test was applied to the
students of the research groups (experimental and control) on Sunday
(4/11/2018). The students' answers were corrected and unloaded according to
the answer key to test the mathematical skill of the previous information.
(13.618) and a standard deviation of (2.535), while the mathematical mean of
the sports proficiency test scores reached the previous information of the
control group (12.629) and a standard deviation of (3.049). To verify the
homogeneity of the variation of the two groups (1), the Levine test was used
for two independent samples. The value of Levin (F) calculated at (1.594) was
at a level of (0.211), which is greater than the level of significance (0.05). In
order to determine the difference between the mean scores of the two groups
(experimental and control) in the mathematical skill test variable, the t-test was
used for two independent samples. The calculated T value (1.463) was 0.148
(0.05) with freedom degree (67), indicating that there is no significant differen-
ce Statistical differences between the mean scores of the two groups, which
means that the two sets of research in this variable unequal, and Table 2 illus

trates this.

Table (2) / Statistical results of the two groups (experimental and control) in variables (age, intelligence, previous achievement, previous knowledge test, mathematical skill test with previous information)

| indication 0.05 (at | Sig. t-test | t-test | Sig. Leven's | Leven's test | Std.Deviation | Mean | Division | Group | Variables |
|---|---|---|---|---|---|---|---|---|---|
| non-ind | 0.576 | 0.562 | 0.153 | 2.087 | 6.391 | 163.62 | G | Experimental | Age of female student calculated by months |
| | | | | | 8.388 | 164.63 | H | Control | |
| non-ind | 0.684 | 0.409 | 0.941 | 0.006 | 5.527 | 21.382 | G | Experimental | Intelligence test |
| | | | | | 5.266 | 21.914 | H | Control | |
| non-ind | 0.594 | 0.535 | 0.944 | 0.005 | 11.954 | 64.000 | G | Experimental | Previous achievement in mathematics |
| | | | | | 11.092 | 65.486 | H | Control | |
| non-ind | 0.481 | 0.708 | 0.057 | 3.765 | 3.207 | 9.324 | G | Experimental | Mathematical knowledge test previous |
| | | | | | 2.324 | 9.800 | H | Control | |
| non-ind | 0.148 | 1.463 | 0.211 | 1.594 | 2.535 | 13.618 | G | Experimental | Mathematical Proficiency test in previous information |
| | | | | | 3.049 | 12.629 | H | Control | |

Fifth: Research requirements:

1) Determination of the scientific material: The researcher identified the scientific material that will be studied for the students of the research groups (experimental and control) of the three chapters which are (Chapter II: The real numbers, Chapter III: Haddism, Chapter IV: Equations and Differences) , Amir Abdul Majid and others, 2017), Part I, i.

2) The formulation of behavioral goals: The behavioral goal is "the desired behavioral change that we expect to occur in the behavior of the learner as a result of a certain educational experience." (Faraj, 2007: 25), the researcher formulated 233 behavioral goals based on the Merill classification of the cognitive field in its three levels: memory, application and discovery. It was presented to a number of arbitrators and specialists in the teaching methods of mathematics (85%), and above the opinions of the arbitrators, some of which were modified linguistically with the deletion of five goals, the number of them after the amendment (228) behavioral goals.

3) Preparation of teaching plans: The teaching plan is a set of organizational procedures designed and implemented by the teacher to ensure the success of the teaching process and achieve the desired educational goals. (Salameh et al., 2009: 951). In light of the content of the educational material to be studied in the experiment, the researcher prepared teaching plans for each group of research groups (experimental and control). A model was presented to the

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arbitrators and specialists in the field of education and mathematics, (56) a daily plan for each of the two groups of research (experimental and control). The total number of study plans was (56) .

Sixth: Preparation of Research Tools: The researcher prepared two tools to measure the dependent variable:

First: the test of sports ingenuity:

• Determination of the objective of the test: It is a measure of the level of sophistication of the second grade students, as this test involves measuring their knowledge.

• Determining the dimensions of mathematical proficiency and the indicators that indicate it: After the researcher learned about the literature, such as books (Badawi, 2019) and previous studies that dealt with the mathematical prowess such as (Radwan, 2016), (Dani, 2017), (Jassim, 2018) Al-Obaidi, 2018); a questionnaire was prepared in which the dimensions of the mathematical skill (cognitive aspect) were defined as four dimensions: conceptual comprehension, procedural fluency, strategic competence, adaptive reasoning, which can be measured by testing, It represents one dimension which can be measured by a scale (a scale) The tendency towards mathematics). In addition, the indicators of each dimension of mathematical excellence as a whole were determined and distributed to the arbitrators to determine their relevance to the sample.

• Determining the scientific material: The content of the scientific material has been determined for the research groups (the experimental and the control) in the three chapters which are (Chapter 2: The real numbers, Chapter 3: Al-Hadoudiyya, Chapter 4: Equations and Differences) That fit this content.

• The formulation of the test paragraphs in light of the specific indicators: After determining the dimensions of mathematical proficiency and the indicators to be used; the test paragraphs were formulated according to the indicators of each dimension of cognitive sports ingenuity, the researcher prepared (23) paragraphs, including (10) (13) paragraphs, (7) paragraphs for conceptual comprehension, (5) paragraphs for procedural fluency, (5) paragraphs for strategic efficiency, and (6) paragraphs for adaptive inference.

• Preparation of test instructions: Include the nature of the test and its objective, and how to answer it, and taking into account the reading of each paragraph accurately and focus and non-answer randomly or leave any paragraph without an answer, explaining that the answer is on the question sheet.

• Preparation of the correction instructions: A typical answer was prepared for the test paragraphs and was adopted in the correction. The objective paragraphs were given one degree for the correct answer and zero for the wrong answer or left without an answer. The essay clauses ranged between 0-2 and 0-

3), (0-4) degree, and thus became a total score for the test of sports ingenuity (50) degree.

• Presentation of the test paragraphs to the arbitrators: The researcher presented the test paragraphs and the instructions for the answer and correction to the arbitrators. The arbitrators' approval of paragraphs (23) was greater than (84%), thus the test became ready for the exploratory application.

• The pilot application to test the mathematical skill:

A) The first pilot application (sample of information): The test of sports ingenuity was applied on Wednesday (9/1/2019) on a sample of (30) female students of the second intermediate grade in the intermediate (Al Manal Girls) For the education of Baghdad / Rusafa II, under the book facilitation of the task, after agreement with the school material and school administration on the date of the test and its purpose is:

1) Verify the clarity of the test paragraphs and instructions.

2) Determine the time taken to answer all test paragraphs.

(65) minutes, to be the time to answer the students for all paragraphs of the test of sports prowess.

B) Second survey application (sample of statistical analysis): After the application of the mathematical skill test on the sample of the information and making the appropriate modifications to the test, the test is ready to be applied for the second time to conduct the statistical analysis of the test paragraphs. It was applied to the sample of the statistical analysis of (110) The students of the second grade intermediate in the school (Nazik Al-Malaika) of the Directorate General of Education Baghdad / Rusafa the second on Sunday (13/1/2019) m, under the book facilitation of the task, it was agreed with the school administration to conduct and inform students before five days From the date of application of the test.

• Statistical analysis of the test paragraphs: After applying the test on the sample of the statistical analysis, the following was done:

1) Correcting the answers of the students based on the typical answer key.

2) Exclusion of the grades of female students statistically significant.

3) Order the grades of the answers in descending order from the highest college degree to the lowest college degree.

4) Determine the group with the highest grades (27%) and (30) students, and determine the group with the lowest grades (minimum) by 27% and was (30) students, for statistical analysis.

The difficulty factor for the mathematical proficiency test paragraphs: To verify the difficulty of the mathematical proficiency test paragraphs, the equation for finding the difficulty coefficient for both the index paragraphs and the thematic paragraphs was applied. The difficulty factor value for the thematic paragraphs ranged from 0.28 to 0.60; (0.28 - 0.53). Thus, the test paragraphs

are acceptable and their coefficient of difficulty is suitable as they ranged from 0.20 to 0.80. (Bloom et al., 1983: 607)

The coefficient of discrimination for the mathematical proficiency test paragraphs: To verify that all the test paragraphs are distinct, the coefficient of discrimination for each of the thematic and essay paragraphs was calculated based on the respective equation; it was found to range from 0.23 to 0.37 for the thematic paragraphs, 0.22-0.48) for the paragraphs of the essay, and thus the test paragraphs are acceptable in their distinction, since the paragraph is considered good and acceptable if the coefficient of discrimination is 20% or more. (Dulaimi and Adnan, 2005: 90)

The effectiveness of the wrong alternatives: The effectiveness of the alternatives to the thematic paragraphs, which were (10) items in the test, found that it attracted the students of the lower group more than the students of the upper group, and all the alternatives negative, indicating the effectiveness of all the wrong alternatives.

• Validation of the test:

1) Virtual honesty: Achieve the honesty of the virtual through the presentation of the paragraphs of the test of sportsmanship on the number of arbitrators in mathematics and methods of teaching, measurement, evaluation and psychology, and thus the apparent honesty of the test is verified.

2) Honesty Building: This kind of honesty can be achieved by finding the correlation between:

The score of each paragraph in the total test scores: For the purpose of verifying the internal honesty of the test, use the Pearson correlation coefficient to extract the correlation between the scores of each test clause in the total test scores. All test paragraphs were statistically significant, Correlation coefficients (** 0.188 - ** 0.653), which is a good indicator of the validity of construction to test sports ingenuity.

The degrees of each paragraph with its dimension dimensions: Use the Pearson correlation coefficient to derive the correlation between the scores of each test paragraph with its dimension dimensions. All the test paragraphs were statistically significant. The correlation coefficients ranged between (0.248 - ** 0.790) which is a good indicator of the sincerity of construction to test sports ingenuity.

To determine the correlation between the degrees of each dimension and the total test scores, use the Pearson correlation coefficient as all test paragraphs were statistically significant. The correlation coefficients ranged from (0.725 - ** 0.846) Good on the honesty of construction to test sports prowess.

• Stability:

Stability of the test: The Alpha-Cronbach equation was used to calculate the

stability of the test, which includes the objective and transitional paragraphs. The stability coefficient (0.77) is a good indicator of the stability of the test. Research in the field of measurement and evaluation indicates that the test is constant If the value of its stability is (0.67 and above. (Allam, 2000: 543 (

The correction of the test paragraphs was corrected by the researcher. After a period of time (16) days, the correction was repeated again by the researcher, and it was based on the cooper equation. The results showed that the ratio of the correction between the two corrections was high (96%). The test was then corrected again by another corrector. Based on the same equation, the correction ratio was high at 94%.

• Mathematical proficiency test in its final form: After the statistical analysis of the mathematical proficiency test paragraphs, the test is ready in its final form and is for final application with (23) thematic and pans, with a total score of (50) degrees.

Second: Building the scale (inclination towards mathematics):

The objective of the scale is to identify the level of inclination towards mathematics among second-grade students in the intermediate grade. This measure relates to the measurement of their emotional side.

Determination of indicators of the scale of inclination produced towards mathematics: After the researcher acquainted with the literature and previous studies that dealt with the mathematical skill such as (Radwan, 2016), (Dani, 2017) and (Jassim, 2018) and (Obeidi, 2018); did not find a measure (NRC, 2001). It is meant to look at mathematics as realistic, useful and meaningful, and must be taken into consideration, coupled with the person's diligence, diligence and efficiency. NRC, 2001: 115). A questionnaire was prepared which included the identification of sub-indicators of this dimension (inclination produced towards mathematics):

The feeling that mathematics is a useful, necessary and realistic material that needs attention.

The belief that perseverance and individual diligence achieves success in mathematics.

Formulation of the paragraphs of each of the indicators of the scale: After determining the specific indicators of this dimension (inclination produced towards mathematics); the paragraphs of each indicator of the scale were formulated, the number of paragraphs of the scale (30) paragraph, the scale included positive paragraphs and negative paragraphs, With each positive paragraph followed by a negative paragraph, to reveal the validity of the response of the respondent.

Prepare the scale instructions: Include the idea of the purpose of this scale, how to answer the paragraphs of the scale by example, as well as read each paragra

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ph accurately, and put the (()) under the alternative that you deem appropriate, taking into account not to leave any paragraph Scale without answer, or choose more than one alternative to the paragraph.

Formulation of the correction instructions: The researcher adopted the four-choice Likert method, and each of the four paragraphs of the scale has four alternatives to the answer (always, often, sometimes, never). Therefore the positive paragraphs take the following grades respectively (1,2,3,4) ), While negative paragraphs are given the following grades respectively (4,3,2,1), thus the range of degrees of the scale (30 - 120) degrees.

The researcher presented the paragraphs of the scale and its instructions to the arbitrators in the methods of teaching mathematics and educational and psychological sciences to express their views on the validity of the scale and its evaluation in terms of the relevance of the paragraphs to the index for which it was developed, the clarity of the paragraphs and the accuracy of their formulation, Because the verdict issued by them is an indication of the validity of the scale, and the approval of the arbitrators on paragraphs (30) by more than (85%), and thus the standard is ready for the implementation of the survey.

Spatial application of the slope scale produced for mathematics:

Application of the first survey (sample of information): The slope scale produced for mathematics was applied on Monday (7/1/2019) on a sample of (30) female students of the second intermediate grade in the intermediate (Al Manal Girls) General for the education of Baghdad / Rusafa second under the book facilitation of the task, after agreement with the school material and school administration on the date of application of the measure, and its purpose is:

Check the clarity and instructions of the scale paragraphs.

Define the time taken to answer all the paragraphs of the scale.

(30) minutes, to be the time set for the response of students on all the scales of the inclination produced towards mathematics.

The second survey application (the sample of statistical analysis): After applying the measure of inclination produced to the mathematics on the sample of information and making the appropriate adjustments, the scale is ready to be applied for the second time to conduct the statistical analysis of its paragraphs. It was applied to the statistical analysis sample of (110) Of the second grade students in the school (Nazik Al-Malaika) of the Directorate General of Education Baghdad / Rusafa the second on Tuesday (8/1/2019), under the book facilitation mission.

Statistical Analysis of Scales of the Scale: After the researcher applied the scale to the sample of the statistical analysis, the following was done:

Correct the answers of students.

Exclusion of the grades of female students.

Sorting the grades of answers by descending order from the highest college degree to the lowest college degree.

The highest score (27%) was determined by 30 students and the lowest score was (27%) and 30 students were selected for statistical analysis.

To measure the difference between the average scores of the upper and lower groups of each of the scales of the scale, It was found that all the scales were distinguished at the level of significance (0.05) and the degree of freedom (58).

Validation of the scale: The validity of the measure of inclination produced towards mathematics has been verified using two types of honesty:

Virtual honesty: It is meant by honesty which measures what is prepared to measure it ostensibly. (Naimi, 2014: 222). The researcher presented the scales of the inclination produced towards mathematics on a number of arbitrators in mathematics and methods of teaching, measurement, evaluation and psychology, thus the apparent honesty of the scale is verified.

Honesty Building: This kind of honesty can be achieved by finding the correlation between:

The score of each paragraph in the total scale of the scale: For the purpose of verifying the internal honesty of the scale, use the Pearson correlation coefficient to derive the correlation between the scores of each of the scales of the scale by the total scale of the scale. All the paragraphs of the scale were statistically significant, Correlation coefficients between (** 0.271 - ** 0.651) which is a good indicator of the sincerity of the construction of the slope scale produced towards mathematics.

The degrees of each paragraph in its index scores: Use the Pearson correlation coefficient to derive the correlation between the degree of each of the scales and the degree of its index. All the paragraphs of the scale were statistically significant. The correlation coefficients ranged from ** 0.214 - * 0.731) which is a good indicator of the sincerity of the construction of the scale of inclination produced towards mathematics.

The degrees of each index in the total scale of the scale: To extract the correlation between the scores of each index with the total scale of the scale, use the Pearson correlation coefficient as all the paragraphs of the scale were statistically significant. The correlation coefficients ranged between (0.411 - ** 0.507) Good on the sincerity of the construction of the scale of inclination produced towards mathematics.

• Stability of the scale: The researcher adopted the equation (Vkronbach) to extract the stability of the measure of inclination produced towards mathematics; the value of stability factor (0.88), which is very good value.

• The measure of inclination produced for mathematics in its final form: After

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the statistical analysis of the scales of the inclination produced for mathematics, the scale is ready in its final form, and the final application is 30 paragraphs, with a total score of 120 degrees. The scale consists of four alternatives Are: (always, often, sometimes, and never) for each of the paragraphs of the scale.

Procedures for applying the experiment: The experiment was applied in the first semester of the academic year (2018 - 2019). It started on Monday (5/11/2018) and ended on Thursday (17/1/2019) The experimental group studied (c) based on the periodic survey model. The control group studied (e) according to the usual method of (5) lessons per week for each group, according to the teaching plans prepared by the researcher for each and after the completion of teaching the students content In the course of the experiment, and after the researcher (female) students a week before the application date of:

1) Test of mathematical proficiency: the test was applied in the final version, at the same time on the groups of research (experimental and control) on Wednesday (16/1/2019) m.

2) Scale of inclination towards mathematics: The standard was applied in the final form, Annex (17), at the same time on the experimental groups (control and control) on Thursday (10/1/2019) m.

Then the researcher corrected the answers, and thus obtained the raw grades for the students of the research groups (experimental and control) in (the test of mathematical prowess, and the measure of inclination produced towards mathematics), it is worth noting that the dimensions of mathematical ingenuity are of the same importance, Equal, and as follows:

1) The degree of proficiency test sports: the four cognitive dimensions (conceptual comprehension, procedural fluency, strategic efficiency and adaptive reasoning) of (80) degrees.

2) degree of inclination produced towards mathematics: the fifth dimension of (20) degree.

The researcher presented how to calculate the overall score of the mathematical proficiency to the arbitrators in the methods of teaching mathematics, statistics, measurement and evaluation to express their opinions. The approval of the arbitrators came at a rate greater than 95% (80) degrees, while the degree of inclination produced towards mathematics has been converted from (120) to (20) degrees, and thus became the total degree of sports proficiency as a whole of (100) degree, and thus became the degree of total mathematical skill ready for statistical processing and down Of the results.

Statistical methods: The statistical program (spss) of social sciences version (23) was used in data processing statistically. The researcher used the

following statistical methods: (T-test for two independent samples, Levin test for two independent samples, Alfa-Kronbach formula, Cooper equation, Pearson correlation coefficient, ETA box).

Results: For the purpose of verifying the validity of the first zero hypothesis, which 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 the mathematics according to the periodic survey model and average scores of students of the control group who studied The same rule was applied according to the usual method of mathematical proficiency as a whole. The mathematical proficiency test and the measure of inclination produced towards mathematics were applied and the students' answers were corrected. The total score of the mathematical skill was calculated for each group of the experimental and control groups. The statistical program (SPSS) is used to obtain the statistical description of the raw data of the two groups of research (experimental and control) in mathematical proficiency as a whole, and Table (4) shows this.

Table (4) / Statistical results of the overall mathematical proficiency of the research groups (experimental and control)

| Indicatio 0.05 (at | df | (T-test) | | Leven's test | | Std. Error Mean | Std. Deviation | Mean | Number of female students | Division | Group |
| | | Sig. t-test | X( | Sig. Leven's | F( | | | | | | |
| ind. | 67 | 0.043 | 2.058 | 0.959 | 0.003 | 2.279 | 13.287 | 64.559 | 34 | G | Experimental |
| | | | | | | 2.170 | 12.839 | 58.086 | 35 | H | Control |

The average score of students in the experimental group (64.559) and the standard deviation of (13.287), while the average of the students of the control group (58.086) and the standard deviation of (12.839), and the application of (s Test'Levene) The difference between the difference between the scores of the students of the two groups of research (experimental and control), the value of (F) (0.003) at the level of significance (0.959) which is greater than the level of significance (0.05), which means that the two groups homogeneous in this variable, and to know the difference between Average scores of the students of the two research groups (experimental and control) The t-test was applied for two independent samples, T (2.058) at a level of significance (0.043), which is smaller than the level of significance adopted (0.05) and degree of freedom

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(67), and this indicates the superiority of students of the experimental group, who studied according to the model of periodic survey on students of the control group who studied on The usual method of mathematical ingenuity as a whole, thereby rejecting the first zero hypothesis and accepting the alternative hypothesis.

In order to determine the effect of the independent variable (periodic inquiry model) in the dependent variable, the η2 square test was used to determine the magnitude of the effect of this independent variable and to make sure that the magnitude of the resulting differences using t-test are real differences The independent variable and not to other variables, the value of both (η2) and (d) was extracted, as shown in Table (5)

Table (5) / value (η2) and (d) and the magnitude of the effect on the mathematical prowess of the two research groups

| Size of the effect | d | η² | df | t-test | The dependent variable | The independent variable |
|---|---|---|---|---|---|---|
| Medium | 0.503 | 0.0594 | 67 | 2.058 | Mathematical Proficiency | Cyclic Inquiry Model |

It is clear from Table (5) that the effect of the (periodic survey model) on the variable (mathematical proficiency) is average. This indicates that the effect of the independent variable on the sophistication of the intermediate second grade students was average and for the benefit of the experimental group studied according to this periodic survey model.

Explanation of the results: The results of the research presented in Table (4) showed that the experimental group of students who studied according to the periodic survey model surpassed the students of the control group who studied according to the usual method of mathematical skill as a whole.

1) the role of the student in this model as it is the focus of the educational process, and this model contributes to the promotion of constructive learning, and enhance the spirit of cooperation, and this in turn leads to increased interest and desire of students towards learning, and thus increase the level of proficiency sports.

2) that the periodic survey model has helped to increase the students' understanding of mathematical concepts and generalizations. The students in the experimental group are allowed to employ their procedural skills and their strategic efficiency. It also helps to motivate female students to use their adaptive reasoning through reflection, reflection and intuition. Implementing the solution.

3) Teaching in accordance with this model helped students to increase their tendencies towards mathematics, as students feel the importance and usefulness of mathematics when it presents the situation of life, and that perseverance and diligence in solving them achieve success.

4) The nature of the stages of the periodic survey model, the way in which these stages were presented, and the various survey activities that the students underwent have contributed effectively to improving the level of mathematical proficiency and the superiority of the experimental group students to the control.

These results are consistent with (Dani, 2017) and (Jassim, 2018), which dealt with other independent variables.

CONCLUSIONS: According to the results of the current research, the researcher reached the following conclusions:

1) Teaching according to the periodic survey model has contributed to raising the level of mathematical proficiency and improving it among second grade students.

2) that the size of the effect of the periodic survey model was average in mathematical prowess.

Recommendations: In the light of the research results, the researcher recommends the following:

1) To draw the attention of officials in the directorates of education to the preparation of training courses for teachers and teachers focused on the application of the periodic survey model and how to employ it in the teaching of mathematics.

2) Encourage and encourage teachers and teachers of mathematics at all levels of study to use the periodic survey model.

3) To draw the attention of the authors of the school mathematics curriculum at the intermediate stage to enrich the school mathematics book with exercises and questions that measure the dimensions of the five sports ingenuity.

4) The need to include in the school mathematics books various survey activities, taking into consideration that these survey activities are compatible with the age level of students at each stage of the study.

Proposals: In order to complete this research, the researcher proposes the following:

1) Conduct studies to investigate the effect or effectiveness of teaching the periodic survey model in other variables such as axial thinking, mathematical thinking, and visual thinking.

2) Conduct a similar study of this research on other mathematical subjects and different stages of study.

3) Conduct descriptive studies that include the analysis of mathematics books in light of the dimensions of mathematical ingenuity.

4) Conduct a study to determine the extent to which the teachers and teachers of mathematics for the skill of sports.

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