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Research Article

The Effect of Using the Neale Model in Acquiring Mathematical Concepts for Fifth Classes of Primary School

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Abstract

The current research aims at identifying the effect of using the Neale model in acquiring mathematical concepts for fifth class students. The research community consisted of students of the fifth morning grade of primary school, in the government schools affiliated to the General Directorate of Education in Baghdad / Karkh third, for the academic year (2020-2021), and the researcher chose the experimental design with two groups (experimental and control).

The research data comprised of students of (Al-Abrar Elementary Mixed School), as the research amounted to (62) students, with (32) students for the experimental group, and (30) students for the control group. The two research groups were rewarded with the variables (chronological age in months, educational attainment of the parents, previous information test, previous academic achievement, intelligence test [Raven]).

The tool of this study was built, a test of acquiring mathematical concepts, and its paragraphs consisted of (24) items of the type of objective tests, which are multiple-choice, and each paragraph has four alternatives. The researchers made sure of the validity and reliability of the research tool, and the experimental group was studied according to the (Neale model), and the control group was studied according to the (ordinary method). After the end of the experiment, the search tool was applied using the t-test for two unequal independent samples.

By verifying the research hypothesis, the results of the research were reached (the students of the experimental group outperformed the students of the control group). Thus, the researchers concluded that (Neale model) has an impact on acquiring mathematical concepts for the students of the experimental group from the fifth grade of primary school, and then they recommend a number of recommendations, including the training of mathematics teachers before the service and its praise on the (Neale) model to develop their previous information and keep abreast of developments.

The two researchers made a number of proposals, including conducting other studies to demonstrate the effect of teaching using the Neale model in teaching mathematics on other dependent variables such as (scientific trends, scientific inclination, learning processes, scientific thinking, critical thinking, and others).

Keywords: Neale model, concept acquisition, mathematical concepts.

Researches' problem:

Modern educational trends take into account all the teacher's actions, activities and educational strategies, in order to ensure the progress of the educational process, and to see the different models for organizing educational content, through which he progresses by explaining the study material in a sequence consistent with the mental and psychological characteristics of the learner and in a way that enables the learner realizing the facts and the interrelationships between the elements of the educational material and benefiting from them in dealing with multiple life situations.

A number of researchers believe that the weak ability of the learners to focus information is due to several factors, including their failure to encode the information or their inaccuracy in storing it, and accordingly it was necessary to repeat Considering the methods, strategies and methods of teaching academic subjects, especially mathematics, so that this subject becomes a real and effective tool in building and forming the thought, conscience and skills of learners, and by informing the researchers of a number of educational sources that indicated the weakness of students in acquiring mathematical concepts in mathematics. The researchers felt the problem of their research.

Multiple studies have confirmed a weakness in the acquisition of mathematical concepts among fifth graders, including (Al-Bayati study, 2010), (Ali study, 2013) and (Al-Ghanimawi study, 2020). These studies also showed the weak treatment of that and the insufficiency of mathematics teachers, which may be due to their lack of knowledge or lack of interest in modern educational methods and methods, and these studies recommended the great need to use new models and strategies that use educational techniques and focus on the role of the learner and his self-activity to guide the educational process in order to be consistent with The data of the

changes witnessed in our contemporary world that affect education to raise the level of students in their acquisition of mathematical concepts.

In order to ascertain the reality of the problem and its extent, they adopted the field procedure, so they intended to direct an open questionnaire to a number of those who study mathematics for the fifth grade of primary school in Baghdad schools (the third Karkh district), where the questionnaire included a number of the opinions of teachers of mathematics with experience in education who are not less than Their experience for the five years, in which the researchers asked an open question about the reality of teaching fifth-grade students and whether they suffer from weaknesses in acquiring mathematical concepts in mathematics.

The answers (74%) of teachers confirm the existence of weaknesses among students in acquiring mathematical concepts in mathematics. Maths.(henceforth), the researchers made sure of the problem of their research and that it deserves study, so the researchers wanted to experiment with modern educational models, perhaps contributing to addressing the weaknesses of acquiring mathematical concepts or reducing their severity among students.

Therefore, the research problem can be formulated in the following question:

What is the effect of using the Neale model on acquiring mathematical concepts for fifth classess?

Researches' Importance:

Because the primary stage represents the cornerstone of subsequent educational levels, education in the primary stage tends in large part to learn concepts that constitute a necessary base for cognitive behavior and require a relatively long period of time to be learned, as the concept gradually moves from a state of ambiguity to a state of clarity, and the greatest burden falls on The primary school aims to develop these different concepts and meanings among students in proportion to their abilities.
(Atiya, 2008:66).

Teaching models are among the important components in the educational process, as they represent the main duty of the teacher and refer to the educational procedures that he uses to apply the selected content and achieve the desired goals, and often depends on his success in the teaching profession and the success of learners in their studies, due to its great and direct impact on them through the educational models followed. (Ismail, 2013: 175).

The importance of (the Neale model) lies in the logical sequence with its sequential and organized steps, which contribute to the development of learners' awareness and understanding of the steps they are doing, as well as developing their communication through the use of discussion and dialogue, positive interaction between learners and the teacher, and creating opportunities for them In order to think about different learning situations, and practice mental operations by solving activities, exercises and assignments, which develop their cognitive abilities and skills. (Muslim, 2015: 117).

Because of the great importance of the process of learning and acquiring concepts, educators have considered it one of the objectives of the general and basic education process for teaching mathematics and in various school stages from the primary to the intermediate stage to the preparatory stage, as it is a process that facilitates and organizes the process of general education and helps the learner to elicit facts and retain information in a way. Better and longer. (Zaytoun, 1993: 80).

The importance of the current research is summarized in:

1-The importance of the process of learning mathematical concepts for primary school students as a starting point for improving achievement because it forms the basis for understanding the content of the educational material, which may reflect positively on the outcomes of the educational process.

2-This study may help the learners to learn in an atmosphere of fun and enjoyment, away from tension and fear of mathematics, and to eliminate the phenomenon of the low level of learners' achievement and their anxiety and grumbling about mathematics.

3-This study may benefit learners by linking mathematics with other subjects, and highlighting its role in their daily lives.

4-Adding some ideas about teaching mathematics in the primary stage by using the (Neale) educational model as a modern approach to education.

5-The importance of using modern models in education, which will reduce the methods of memorization, memorization and retrieval that reduce students' motivation, which is reflected on the level of their academic achievement.

6-The current study is one of the first studies to the knowledge of the researchers dealing with the effect of the educational model (Neale) on the fifth grade students in acquiring mathematical concepts in mathematics.

7-The importance of the primary stage due to it is basicness and significance stage in the life of students, and it is the cornerstone of all subsequent education processes.

Researches' Goal:

The current research aims to identify (the effect of using the Neale model on acquiring mathematical concepts for fifth-class students).

Research Hypothesis:

There is no statistically significant difference at the significance level (0.05) between the average scores of the experimental group students (who will study according to the Neale model) and the average scores of the control group students (who will study the subject in the usual way) in the test of acquiring mathematical concepts.

Research limitations: The current research was limited to:

-Public primary day schools affiliated to the General Directorate of Education in the third governorate of Baghdad / Karkh.

The first semester of the academic year (2020-2021).

Fifth grade students.

-Topics included in the first four chapters of the mathematics curriculum for the fifth grade of primary school, 2019.

Defining terms:

Impact: defined in The American Dictionary as the ability to achieve results or impressions produced on the mind of the examinee and according to the design or method used, and it is the thing that produces a certain impression or supports the tested design.

The American Dictionary, (2010: 263)

It is procedurally defined: the change caused by the Neale model as an independent variable in the acquisition of mathematical concepts in mathematics for students (the research sample), and it is measured by the dimensional mathematical concepts acquisition test.

-**Model:** Neale defined it (Al-Khalili et al., 1996) as an educational and cognitive model in which the learner moves in the acquisition of the concept in nine stages: direct teaching, review, review, investigation, activities, elucidation or expression,

dialogue and discussion, polling, application and summarization.

(Al-Khalili et al., 1996: 485-486).

The Neale model is known procedurally: an educational model for organizing the teaching of mathematical concepts included in the first four chapters of the mathematics book for students (the research sample).

-**Acquisition of concepts:** Al-Wundawi, (2007) defines it as a mental process towards a group of stimuli presented to the learner in a specific educational situation, so that he has a mental image of these stimuli, which can be called and generalized in new educational situations. (Al-Wondawi, 2007: 26) The acquisition of concepts procedurally is defined as: the ability of the fifth grade students (the research sample) to know the concept, distinguish and apply it, which can be inferred from their results.

-**Mathematical concepts:** he defines them (Badawi, 2003) as an abstraction of the set of common characteristics between a set of cases or examples of the concept. (Badawi, 2003: 62).

Mathematical concepts are defined procedurally: a term, word, or symbol that expresses a group of common and similar characteristics among a group of examples of one of the concepts mentioned in the chapters (first, second, third and fourth) from the mathematics book for the fifth grade of primary school.

Theoretical Background and Previous Studies

Several different modern theories and philosophies appeared in their ideas, principles, foundations and objectives, but they shared their interest in teaching methods and methods and worked on updating and developing them in a way that contributes to the advancement of the educational process. The history of the emergence of this theory can be noticed to the last half of the twentieth century. (Wafa, 2009: 460).

The constructivist theory is one of the intellectual doctrines that emerged in the modern era and constituted a revolution in research and application in human and social studies and ways of dealing with and acquiring knowledge. The constructivist theory includes many modern education strategies such as the learning cycle, the constructivist learning model, the Tragist model, the Neale model, the task-based learning model, and others, which made the learner build his knowledge in a real social and physical environment that allows him to acquire concepts about the way his activity and self-practices and enable him to review and reorganize his knowledge structure to adapt to the new learning. (Atiya, 245: 2015).

Foundations of Constructivist Theory

1-It is based on learning, not education.
2-It encourages learners to research and investigate.
3-Encourage learners to participate in competition and social interaction.
4-It makes learners creative.
5-Put the learners in real situations and problems.
6-It encourages and accepts learners' independence.

7-Emphasizes performance and understanding when evaluating the learner.
-8Take the mental model into account. (Qarni, 236:2013).

The Structural Role of the Teacher:

In constructivist theory, the teacher is the guide, guide, designer of instructional strategies, the creator of various activities for students, selects the appropriate content, encourages the necessary learning process, directs the students' tendencies and tendencies towards better growth, then checks the occurrence of the learning process and addresses defects and errors. (Agha, 2007: 17).

The structural role of the learner:

The role of the learner, according to the constructivist theory, is completely different from his role in the regular classes, with the following:

1-He always builds his knowledge and builds a position on every information.
2-Develops active processes for the introduction and understanding of knowledge.
3-He has experience of constructive, collaborative and organizing knowledge environment around the issue.
4-The student rediscovers knowledge for himself.
5-Involvement of the teacher and colleagues in the management and evaluation of learning. (Qatami, 776:2013).

The Neale model:

This model was invented by (Daniel-Neale) and a group of his colleagues in 1987, and the idea of this model was crystallized from the ideas found in the learning cycle, the advanced organizer and concept maps, as direct education focuses on the teacher's attention from the learning outcomes to the learners and the establishment of The teacher speaks about the subject, such as presenting basic information that benefits the learners and they cannot reach in another way, raising the learners' interest and motivation towards learning, mastering the facts, rules and procedures necessary for later learning, and preparing for an activity that is done by indirect teaching, as the previous information is presented and reminds the learners of scientific laws and rules and explains to them how to do The work required and how to draw scientific conclusions, experiences and activities in the context of other teaching methods. (Al-Khalili et al., 1996: 248).

Yassin and Zainab, (2012) added that the teacher gives the learners appropriate materials, questions or pictures and directions that they follow to collect data by means of direct sensory experiences related to concepts and this stage is centered on the learner and the teacher encourages the learners to dialogue among themselves in a cooperative way to formulate interpretations and give predictions, and this stage corresponds to representation in The formation of knowledge according to Piaget and the model designer benefited from the applied development of Osbel's theory of meaningful learning, which is called advanced organizations, which are characterized as an introductory introduction on a level of generality, abstraction and comprehensiveness of the educational material presented with the beginning of new

learning for the availability of intellectual pillars through which the new material is linked to previous experiences. (Yassin and Zainab, 2012: 185).

●**Stages of the Neale model**: This model consists of nine stages through which the lesson is implemented, which are:

1-Instructional

At this stage, the teacher begins by giving a general introduction about the lesson's objectives, content, and activity. The purpose of this step is to focus the learners' attention on what is to be accomplished during the lesson and to stimulate their motivation to engage in the lesson.

2-Review

At this stage, the previous lessons related to the new lesson are discussed in order to prepare the understanding of the developments and concepts of the new or current lesson.

3-Overview

At this stage, a general and preliminary review of the new information or the problem that will be presented, the learners' ideas are also stimulated or brainstormed for them, clarification, explanation and doing what is necessary to match the existing cognitive schemes of the learner related to understanding the phenomenon or

problem required to learn through it and this happens Mentally reconfigure these schemes by modifying them or using other new schemes.

4- Inquiry- Activities

At this stage, the learners deal with the materials, tools, and all devices with which they must carry out manual work through several experimental activities. At this stage, the teacher raises questions and gives hints to test their ideas and gives hints while providing assistance to help the learners reach the desired.

5-Clarification and Expression

At this stage, the learners express the product of their activity to the questions posed by the teacher, and the intent of this is to accustom the learners to contact with others and thus help them express what has been reached during the learning process.

6-Dialogue and discussion

This stage is a stage of discussion of the results reached by the learners after they performed a specific activity. In this step, the teacher asks a set of questions such as (What did you find?), (What happened to you?), (What did you do?) and (What is your evidence for this answer)?

8-**Direct Teaching - Invention**

At this stage, the teacher teaches directly again, where new concepts are taught and explanations are given, and the process of reading the book material takes place, where he discusses the misunderstanding that happened to them or attempts to modify the understanding. In this step, the learners' understanding of what has been learned new information is developed. On the topic of the lesson, not just memorizing information and trying to memorize it.

9-Application

At this stage, new knowledge is tested in other situations, and the purpose is to

expand the learner's understanding and help him solve problems or answer new questions that were not asked to him before.

10-Summarizing and Closure

This step includes presenting a general summary of what has been learned in the lesson and all the results, interpretations, summaries and comprehensive concepts that were addressed in the stage of organizing the knowledge structure and what has been reached in the application step, and usually the teacher undertakes the task of summarizing in the form of brief points followed by a reference to the end of the lesson and farewell to the learners in phrases occasion. (Zaytoon, 2003: 409-416), (Al Khalili, 1996: 485-486).

Concept acquisition:

Emergence of concepts: Learning concepts has become an important educational goal at all levels of learning. Therefore, those interested in learning work on identifying the concepts that the learner learns in the different stages of learning. Rather, they make great efforts to develop materials and procedures that ensure success in learning these concepts. (Al-Turaihi and Hussein, 2012: 207).

Types of concepts: There are various opinions of researchers in defining the types of concepts, including the following:

1.Tangible (physical) concepts: they are concepts that can be developed with the senses and direct and indirect experiences and can be sensed by acting for them such as: the book, the teacher and so on, and these concepts are classified on the basis of the method of formation of the concept.

2.Abstract (cognitive) concepts: they are concepts that cannot be observed and measured by the senses, but by indirect experiences that require mental activity, such as the concepts of: remembering, forgetting, and learning.

3.Symbolic concepts: The concept represents a specific thing. The car is a concept of something that we ride in to reach a specific place, something that indicates luxury and richness or innovation and wonder. (Abu Jumaa, 2012: 62).

Concept specifications:

1.Any concept differs from one person to another according to age and experience.

2.The concept may be very simple and superficial, and it may be itself very deep and thoughtful.

3.Concepts are constantly changing, they change and grow with experience, and their growth is from ambiguity to specificity to clarity, and from superficiality and simplicity to depth and complexity.

4.A single concept may include a group of concepts branching from it.

.5The more the concept grows the closer in its meaning to a generalization. (Kojk, 2001: 183).

Characteristics of concepts: Concepts are characterized by a set of characteristics, as (Qatami et al., 2008) see that the characteristics of concepts are:

1.Concepts are constructed based on previous experience, family background, educational opportunities, as well as emotional and cognitive aspects.

2.They are generalizations that arise through the abstraction of certain sensory events and distinctive decisive properties.
3.Concepts are structures that grow, develop and move towards integration. (Qatami et al., 2008: 129).

Benefits of learning concepts:
1.Acquisition of information through activity and practice, which facilitates its assimilation, remembering and employment.
2.Gaining greater mental capabilities due to memory exercise, training the mind to address problems and making effort to access information.
3.Teaching discovery technique by solving exercises and solving problems, which helps him to create solutions.
4.Increasing the desire for positive learning in discovering the solution, which is the best catalyst in the continuity of teaching and learning.
(Atiya, 2008: 240).
Steps to consider in the process of learning concepts:
1.Aspects of a concept do not all develop at the same rate.
2.A number of concepts develop with the experience that learners go through outside the school, while other concepts depend in their development and formation of the school experience.
3.The development and formation of concepts for learners depends on the experiences they go through and on the level of their perseverance.
4.Focusing on diverse experiences rather than repetition while studying concepts.
5.Classifying the meaning of the concept for the learner in order to develop innovation, taking into account rational training.
6. Gradual learning of concepts and not all at once so as not to lead to a lack of understanding of the concept and the lack of its significance in daily life. (salama ,2004 : 59-60).
The process of forming concepts: Helping learners to form the concept requires a special method of learning in the primary stage. Concepts when forming require many appropriate experiences and that they are easily drawn for them, especially if they are associated with many observable situations by them, and on this basis of the assumptions that are assumed in choosing The formation of the concepts of the learners is based on the basis of verifying the existence of meaning for them, and whether they are able to distinguish between the elements of the class or their ability to derive the general characteristics that apply to the concept that represent the task of analyzing the formation of the concept. (Alwan et al., 2014: 66).
Any concept consists of five basic components:
1.The name of the concept: It refers to the category to which the concept belongs.
2.Defining the concept: It is the statement that identifies and describes the basic characteristics of the concept.
3.Concept examples: They are the examples belonging to the concept.

4.Attributes of the concept: the attributes that distinguish the concept from other concepts.
5.Concept value: It is the extent to which the adjective exists for a particular concept, as the concepts differ among themselves according to the value or degree of the adjective. (Melhem, 2006: 392).

Concept acquisition: The process of acquiring concepts by learners is necessary to understand the basics of human knowledge, increase their abilities for self-learning and follow up on the growth and development of this knowledge, and it is now necessary for the school curricula to direct its attention to concepts to be able to meet this challenge posed by scientific progress. The process of acquiring the concept is done by helping the learner to deal with things and situations on the basis of the common characteristics between them, realize their special features, arrive at the phrase that defines the concept, and develop new meanings in similar situations.
(Al-Rubaie, 2012: 12).

Measuring the learning of the concept: It is possible to ensure the learning and acquisition of the scientific concept through the following:
1.Ensuring the learner's ability to apply the processes of concept formation, which are discrimination, classification and generalization.
2.Providing a definition of the concept, ie expressing in a verbal language the verbal significance of the concept.
3.Apply the scientific concept in unfamiliar life situations, such as applying the “paper” classification to the leaves of trees in the surrounding environment.
4.Provide an explanation of many observations, observations or phenomena in the environment in which the learner lives, such as an explanation of how breathing occurs in animals and plants.
5.Employing the scientific concept and using it in solving problems. The learner learns the concept of atomic

structure, and it is easy for him to write balanced chemical equations.
6.The individual has acquired the concept and has been able to learn it if he can name and specify the specific characteristics of the concept, distinguish the waveform and negative examples through the presence or absence of specific characteristics, and identify new examples of the concept. (Haidar and Abdullah, 1999: 137).

Previous Studies:
1-Study of (Lua; 2009): It aimed to know (the effect of using Deans strategy in acquiring and retaining mathematical concepts among sixth graders), and the study sample consisted of (90) sixth grade students distributed into two experimental and control groups. An achievement test for acquiring mathematical concepts is used. The findings of the study resulted in the presence of statistically significant differences between the average scores of students in the experimental group and the control group in acquiring mathematical concepts in favor of the experimental group, and

there are no statistically significant differences between the average scores of students with low achievement in the experimental group and the average scores of their peers from the control group in the test. Mathematical concepts in favor of the experimental group are used.

2-Studyof (Al-Obaidi; 2000): It aimed to know (the effect of using the Merle-Tención strategy in its two teaching styles (Explainer and Interrogative) for acquiring mathematical concepts among second-grade female students at the Institute for Teacher Preparation and their attitudes towards mathematics), where the study sample amounted to (79) female students. They were divided into three groups, two experimental and one control. The researcher used two tools: an achievement test and a tool to measure the students' attitude towards mathematics. The results of the study showed (the first and second experimental groups separately were superior to the control group in acquiring mathematical concepts. The first and second experimental groups separately were superior to the control group in the direction towards mathematics).
3-A study of (Al-Fatlawy; 2010): It aimed to know (the effect of using the Wriglioth model in acquiring and retaining mathematical concepts for second-grade intermediate students). The researcher used the experimental design with partial control for two groups, an experimental group and a control group, and the number of sample members was (71) female students. Divided into two divisions, one of them represented the experimental group with (36) students, and the other represented the control group with (35) students. The researcher took a test in acquiring concepts of the objective type consisting of (50) paragraphs according to Bloom's first three levels (knowledge, understanding, application) of the multiple choice type containing four alternatives, and the study obtained the results (the students of the experimental group outperformed the students of the control group in the test of acquiring mathematical concepts, and the students of the experimental group outperformed the students of the control group in the test of retention of mathematical concepts).

Research Methodology and Procedures:
To achieve the research objective, the following procedures were followed:
First: Experimental design: the researchers adopted the choice of design as an experimental design, which is the design of the two experimental groups and control groups, one of them is partially controlled by the subjects of the post-test in acquiring mathematical concepts, as shown in Figure (1):

dependent variable	independent variable	equivalence	Group
Acquisition of mathematical concepts	(Neale) model	intelligence Chronological age in months Previous information Previous academic achievement Parents' Academic Achievement	Experimental

	Control the usual way		Control

Figure (1) Experimental design of the research

Second: The research community and its sample: The research community included fifth-grade students in the government primary morning schools of the Baghdad Education Directorate (Third Karkh) for the academic year (2020-2021).

The sample of the research was intentionally students of (Al-Abrar Elementary Mixed School), and after obtaining official approvals from the General Directorate of Education in Baghdad (Third Karkh), the researchers visited the school and found that the number of people for the fifth grade of primary school consists of (3) people for the academic year (2020-2021). And their number was (62) students divided into (3) sections (A, B, C). By random drawing, section (A) was chosen as an experimental group and section (B) as a control group. Section (A) included (32) students, while section (A) included (32) students. Division (B) has 30 students, and no student was excluded from the two classes.

Third: The equivalence of the two research groups: The research groups were rewarded in the variables (intelligence degree, previous achievement in mathematics, prior knowledge test, chronological age in months, parents' academic achievement, as shown in Table (1):

Table (1) The equivalence of the two research groups

Statistical significance	t-test value		control		experimental		group
	tabular	computed	standard deviation	arithmetic mean	standard deviation	arithmetic mean	Equivalence variables
Non-significance	2.000	0.408	1.612	17.233	1.684	17.063	Intelligence
Non-significance	2.000	0.254	1.545	7.600	1.148	7.688	Previous achievement in mathematics
Non-significance	2.000	0.436	2.057	10.333	2.078	10.563	Previous knowledge
Non-significance	2.000	0.124	2.762	111.400	2.788	111.313	Chronological age in months

Fourth: Research Requirements:

The researchers identified the scientific material that he studies for the two research groups (experimental and control), which are represented by the first four chapters of the mathematics book for the fifth grade of primary school.) and they are measurable, observable, and a total of (84). Behavioral objectives were presented to a group of experts, specialists in mathematics, and methods of teaching science as an appendix to give their opinions and observations about them, and their suitability to the level of the goal they measure and their inclusion in the content of the material. The researchers prepared (13) plans Daily teaching for the experimental group that studies according to the (Neale) model, and the same for the control group that studies according to the usual method, as a model for each plan was presented to experts and arbitrators in the field of teaching and education methods.

Fifth: the research tool: the current research includes a dependent variable, which is the acquisition of mathematical concepts, and to identify the extent to which the research goal was achieved, and its null hypothesis, this required the preparation of a test tool for acquiring mathematical concepts, where the researcher prepared a test for the acquisition of mathematical concepts according to the three concept acquisition processes (definition, distinction And after analyzing the classroom content of the mathematics book for the fifth grade of primary school, it was found that it includes (8) main concepts. To prepare the test for acquiring mathematical concepts, the researcher followed the following steps:

1-Determining the objective of the test: It aims to measure the extent to which mathematical concepts are acquired in the topics of the first four seasons, which are: (large numbers, addition and subtraction of large numbers, multiplication of numbers, and division of numbers).

2-Determining the educational outcomes: In light of the analysis of the content of the study material, the main concepts and the sub-concepts included in it were identified, which amounted to (8) concepts. The researchers, after consulting experts and mathematics teachers, were keen to adopt the main concepts for the purpose of preparing the test items.

3-Test items: After taking into consideration that each concept is measured with three test items that represent (defining the concept, distinguishing the concept, applying the concept) and since the test consists of (8) concepts, and for each concept. There are (3) behavioral objectives, that is, the number of The goals amount to (24) goals, and thus the test paragraphs reached (24) items of the type of objective tests and it is a multiple choice, as four alternatives were identified for each paragraph, one of which represents the correct answer.

4-**Selection instructions:** They include:
-Answer instructions: The researcher prepared the answer instructions after formulating the test paragraphs, and they represent general information for the students, and the way to answer the paragraphs by mentioning an illustrative example, and giving an idea of the purpose of the test, and the time allotted to answer, so the paragraphs are ready for the initial application on the exploratory sample.
Correction instructions: The students' answers to the paragraphs of the test of acquiring mathematical concepts were corrected according to the typical answer key, as the correct answer is given one degree, while the wrong or left answer is given or more than one alternative is chosen zero, and thus the test score is limited between (0-24 degree).
-**The validity of the test:** In order to verify the validity of the test, check the apparent validity as follows:
-**Apparent honesty:** the researcher presented the test paragraphs, its instructions and the key to the correct answer to a group of experts and arbitrators in the field of education, teaching methods, measurement, and evaluation. And its paragraphs obtained an agreement percentage (80%), as the test maintained the number of its paragraphs amounting to (24) paragraphs, and the test was considered honest in measuring the acquisition of mathematical concepts for the students of the research sample and the result.
-**Construction validity:** the test was applied to the exploratory sample in order to ensure the clarity of the paragraphs of the test of acquiring mathematical concepts, the instructions for answering, and to determine the time required for the answer. Pupils a week before the exam date, and the test was applied to a sample of (25) fifth-grade students. The two researchers supervised the test, as it became clear that the instructions were clear, and the paragraphs understood, through the few students' questions on the test items.
The time of the test was calculated from By adding the response times of all students divided by their number, it became clear that the average test time is (40) minutes. The test was applied to a second exploratory sample consisting of (100) students of the fifth grade of primary school at (Al-Maqdisi Primary School for Boys) to conduct statistical analysis of the test items, and the scores were arranged in descending order and two sets of scores were taken representing the first upper group as it constituted (27%) of the test scores. The second lower group represents (27%) of the test scores, which had (27) students per group. The answers of the upper and

lower groups were statistically analyzed to find the following:
-Calculating the difficulty coefficient for the test items and found that it ranges between (0.28 - 0.77), which are acceptable coefficients for the items, and the items are of medium difficulty.
-Calculating the discriminatory power for each of the test items, and it was found that it ranges between (0.41-0.60), which are acceptable ratios because they are more than (0.20).
-Effectiveness of alternatives: the researchers used the alternatives effectiveness equation in order to verify the effectiveness of the alternatives and it was found that all values of the wrong alternatives were negative. These results showed that the wrong alternatives had attracted more answers from the students of the lower group than the answers of the students of the higher group; so it was decided to keep the alternative paragraphs.
-**Test reliability:** The researchers relied on the Kewder Richardson equation -20 in calculating the stability of the tests, as the test reliability coefficient calculated in this way was (0.82). Therefore, it can be said that the test has a high degree of stability, and after these procedures, the test is ready for application in final version on the research sample, where the test was applied to the original sample on February 17, 2021 AD.

Sixth: Statistical Means: Appropriate statistical means were used for the research.
Presentation and interpretation of results:
Presentation of the results: After correcting the answers of the two groups (experimental and control), it was found that the average of the experimental group students is equal to (17,813) with a standard deviation of (2,086) and that the average of the students of the control group is (14,767) with a standard deviation of (1,775) and after applying the equation of the (t-test)) for two unequal independent samples, it was found that the calculated t-value is equal to (6,172) which is greater than the tabular t-value of (2,000) at a significance level of (0.05) and a degree of freedom (60).

Thus, we reject the second null hypothesis which states that (there is no a statistically significant difference at the significance level (0.05) between the average scores of the experimental group students who will study according to the (Neale) model and the average scores of the control group students who will study the subject in the usual way in (the test of acquiring mathematical concepts), and as in Table (2).

Table (2)
The arithmetic mean, standard deviation, and the calculated and tabulated T-value of the scores of the students of the two groups (experimental and control) in the test of acquiring mathematical concepts

Significance level (0, 05)	T-value		Degree of freedom	Standard deviation	Arithmetic mean	Number of students	Group
	Tabular	Calculated					
Statistical Significance	2,000	6,172	60	2,086	17,813	32	Experimental
				1,775	14,767	30	Control

Impact size:
The objective of the research is to identify the effect of the (Neale) model on the acquisition of mathematical concepts by fifth-grade students; therefore, the researchers measured the strength and size of the effect caused by the independent variable (Neale) model on the acquisition of mathematical concepts for the experimental group.
And to calculate the size of the effect of the (Neale) model on the experimental group's acquisition of mathematical concepts, the researcher calculated the Eta square (η2), Table (3)

Table (3)
Suggested reference table for determining effect size levels for each effect size measure

size of the effect			The tool used
large	medium	small	η^2
0,14	0,06	0,01	

(Al-Yaqubi, 2010: 84)

Table (4)
The value of (t) tabular and calculated and (η2) the size of the effect on the acquisition of mathematical concepts for the students of the experimental group

Effect size	value η^2	The computed t-value	Variable
Large	0,39	6,17	Acquisition of Mathematical Concepts

It appears from Table (4) that the values of the ETA square amounted to (0.39) and by comparing it with the reference standard for the effect size Table (3) shows that it is large, and this indicates that the (Neale) model had a significant impact on the acquisition of concepts by the experimental group students athleticism compared

to their peers in the control group.

Interpretation of the results: The superiority of the students of the experimental group that was taught according to the (Neale) model over their peers in the control group that was taught according to the usual method is due to the following reasons:

1-Observing the Neale model for the learning styles of the students, each according to his learning style, contributed to helping them participate positively, and boosted their self-confidence and the ability to conclude, which contributed to acquiring the concept and using it in new educational situations.

2-The diversity of the stages of the (Neale) model contributed to the multiplicity and diversity of activities in proportion to sports topics and facilitates the process of acquiring concepts and mastering sports information.

3-The (Neale) model consists of organized stages characterized by clarity and focus, which helped the students of the experimental group to highlight their abilities in dealing with the variables of the educational process, interaction with educational situations, and feedback, and that the interaction of these variables reflected positively on the process of acquiring concepts, as the (Neale) model highlights key elements that are linked together through feedback

4-Providing opportunities to reflect on situations and situations from real life, providing students with appropriate opportunities to express opinion, defend answers, and respect the opinions of others.

Conclusions:

In light of the results of the current research, the researchers reached the following conclusion:

The Neale model has proven effective in acquiring mathematical concepts for fifth graders, with a large effect.

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

1-Adopting the Neale model in teaching mathematics for the fifth grade of primary school, which contributes to the acquisition of mathematical concepts.

2-The introduction of models for teaching concepts, including the Neale model, within the vocabulary of the Mathematics Teaching Methods course, which is taught in the faculties of basic education, to ensure that future teachers are familiar with it.

Suggestions: To complement the results of the current research and to develop it, the

Suggestions:

1-Conducting other studies to demonstrate the effect of teaching using the Neale model in teaching mathematics in other dependent variables such as: (scientific trends, scientific inclination, learning processes, scientific thinking, critical thinking, and others).

2-Conducting a study to compare the effect of the Neale model with other educational models and strategies, such as in achieving dependent variables such as science processes and correcting misconceptions and other variables.

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