



Research Paper

The Effectiveness of an Educational- learning program according to learning anchors in acquiring mathematical skills for fifth grade female students

Meeaad Jasim Salman AL-Sarry¹, DuaaGamel Gadban²

¹Mustansiriyah University; College of Education, , Baghdad, Iraq

²Mustansiriyah University; College of Education, , Baghdad, Iraq

Abstract

The aim of the current research is to identify the effectiveness of an educational-learning program according to the anchors of learning in the mathematical skills of fifth grade female students, and to verify the goal of the research, the following zero hypothesis was put: (There is no statistically significant difference at the level of significance (0.05) between the mean The scores of the students of the experimental group who will study according to the educational-learning program and the average scores of the students of the control group who study according to the usual method of teaching in the post-test in mathematical skills).

The experiment was applied to a sample of 52 female students from Hatem Al-Taie Elementary School of the Baghdad Education Directorate, Al-Rusafa, with (26) female students in the experimental group and (26) female students in the control group, and a mathematical skills acquisition test consisting of objective paragraphs (Multiple choice) with (30) items and essay questions with (15) items. Its validity, stability and psychometric characteristics were verified. The results showed by using statistical analysis the superiority of the students of the experimental group who studied in the educational-learning program according to the learning anchors over the students of the control group who studied in the usual way. In the mathematical skills acquisition test and in the light of the research results, a number of conclusions and recommendations were reached.

Keywords: Educational-Learning Programme, Learning Anchors, Mathematical Skills.

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I. Research Problem

The rapid scientific and technological development in all areas of life has led to a multiplicity of issues and problems related to the teaching and learning of mathematics. There are many factors that negatively affect the teaching and learning of mathematics, represented in teaching methods based on narration, memorization and indoctrination without interest in meaningful understanding, providing ready-made information for the student, not giving various exercises, and the insistence by the administration and the teacher to complete the curriculum without taking into account the acquisition of its concepts. And his skills, which makes the real problem not fall on the concepts and skills included in the curriculum, but on the method of teaching them in an incoherent way that makes it difficult for learners to acquire them, and if acquired, they do not take root in the mind of the learner, which makes them inert, and many studies have confirmed this role for the reality of teaching mathematics Including: the study of (Al-Ghunimawy, 2019) and the study of (Kazem, 2019).

And because the anchors of learning are from modern visions that simulate the minds of the learner and leave him the option open to develop his knowledge, so the interest was in building an educational program according to modern trends that make education solid in the minds of the learner to help him create an educational environment that encourages thinking and overcome the problem of low achievement Inert knowledge, which is represented in the information received by the learner, did not leave a significant functional impact.

Therefore, the problem of the current research lies in the following question: "What is the effectiveness of an educational-learning program according to the learning anchors in acquiring the mathematical skills of the fifth grade female students?"

II. Importance Of Research

The educational process seeks to achieve planned goals for the learners through the implementation of a number of organized procedures, as the desired changes in the behavior of the learners make them able to analyze, organize, compare and provide them with knowledge and information that increase their ability to solve problems and develop their skills so that they can achieve effective adaptation. And the ability to produce and give, which contributes to the development of their societies, maintaining their continuity and development, and adapting to the environment (Zagloul& Shaker, 2007: 83)

Learning anchors from contemporary educational trends, defined as "a theory that aims to overcome the problems of inert knowledge by creating a directed environment that aims to solve complex issues and allows the teacher and the learner to explore this environment." Learning anchors can be counted as a treatment for the problem of inert knowledge, and this problem was described by the scientist (Whitehead, 1929) as that knowledge that the learner learns from texts that he can remember if he is asked about it clearly, but he cannot remember and apply it in solving problems in realistic situations, and Whitehead described it saying: It is the ideas that the mind receives without using or testing them, as an example of them (a learner may read a text from a specific book about a specific concept and succeed in the test dedicated to this concept, but he may struggle or find it difficult to identify the elements of that concept or apply it and distinguish it from among a group Other concepts, because the information has become "inert" because of the methods through which it was presented. Research in the field of anchored education theory has proven that knowledge or information becomes less likely to be "inert" when using methods and strategies that rely on problem-solving instead of traditional methods. (Bransford, 1990: 296)

The environment of learning anchors is completely different from the prevailing educational environments in the traditional system of schools. The school environment is an environment that lacks tangible capabilities and the role of the learner in it is limited to memorization and indoctrination. Thus, he lacks the spirit of pleasure and suspense, and thus leads to the desire for research and discovery, while the environment of learning anchors works to create The desire for learning and knowledge, and urges the generation of alternatives, taking into account the tendencies and needs of the learner, so his role shifts from a recipient to a participant, with the availability of various activities and sensory means that work on translating information into sensory matters that are quickly absorbed and easy to remember because they are linked to his tangible real world, so the learner is in the initial stages He tends to love curiosity and a lot of questions, so this tendency must be satisfied and strengthened in order to motivate him to visualize, imagine, observe, analyze, understand relationships, predict, know the nature and characteristics of things as well as acquire concepts (Adams et al, 1988:167).

The main goal of learning anchors is to help learners to learn and increase their ability to adapt to the environment and to move education from memorization and memorization of information to the development of their mental skills. In addition, it seeks to provide the teacher with a set of exercises that he employs in the lesson to help the learner think actively, and increase or intensify the provision of information or skills in different ways, such as training activities and educational practices that the learner performs within the classroom, in order to enhance its acquisition, depending on several factors, including the learner's learning styles, different teaching methods, and the nature of the educational content (Bransford& others, 1998: 209-226).

And (Abu Zeina, 2010) defines the most important goals of teaching mathematics in that the learner acquires basic concepts, skills and competencies that enable him to employ and use them in his daily life and in his dealings with others, and to get acquainted with the fields of mathematics applications in daily life and in the era of science and technology. It also aims to develop sound attitudes and habits such as order, concentration, patience, self-confidence, cooperation and good behavior in different situations, and this develops positive attitudes towards mathematics and a taste for its beauty (Abu Zeina, 2010: 56-57).

Learning mathematics leads to more than just proficiency in basic skills. It equips students with powerful mini-means of communication and provides them with a framework and tools for thinking and justifying conclusions, enabling them to apply their learning in their daily and future lives and in workplaces (Badawi, 22: 2003).

And learning the mathematical skill plays an important role in learning mathematics, as the weakness of students in some skills narrows their progress in mathematics, and this does not mean that teachers focus on teaching skills only, but a balance must be taken into account between adequate training to teach students mathematical skills and teaching concepts (Barham, 2005:16)

Deniz emphasizes the importance of learning mathematics through direct interaction, the use of teaching aids, sensory models, and the embodiment of mathematical ideas. He focuses on the importance of forming mathematical buildings that arise from direct experience resulting from dealing with the environment, and that the basis of learning is the sensory experiences that the learner himself exercises. (Al-Mashhadani, 2011: 221)

Learning mathematical skills leads to acquiring positive inclinations towards study. Skillful performance generates happiness and pleasure in the soul of its owner, which creates positive inclinations towards study. In addition, it takes into account the individual differences between learners. Mathematical skills are many and wide, and then the learner may find the opportunity to express His capabilities within a specific skill that puts his personality in respect or good acceptance. (Al-Sharif, 1996: 74).

Also, the mathematical skill cannot be established in the mind of the student except through practice, so the teacher has to increase the amount of exercise and these exercises stem from the life of the learner in order to suit his tendencies and desires as much as possible to achieve the motivation towards learning (Ginsburg, 1997: 20).

Teaching mathematical skills plays an important role in teaching mathematics, as it helps students understand ideas and concepts consciously and increases the ability to carry out a variety of activities, as it indicates (Al-Bakri and Afaf, 2002), and that training based on scientific foundations and diversity in training and reinforcement by schools from The important and basic matters in developing and developing sports skills and acquiring them appropriately (Al-Bakri and Afaf, 2002: 133 134).

Some believe that learning mathematical skill has become unnecessary due to technological progress, where computers and calculators can do this task easily and quickly, but teaching and acquiring mathematical skills is still necessary, as it helps the learner to understand consciously and saves time and effort and helps him to accomplish his life tasks (Abu Zina, 2011: 266).

And (Al-Khulaifi, 2000) showed that classroom learning contributes to training students to acquire mathematical skills so that they can benefit from what they learn. Therefore, the teacher should be able to teach learners new and elaborate educational strategies to achieve motivation towards learning. (Al-Khulaifi, 2000: 14)

The acquisition of skills is also an important aspect in learning any subject, not just mathematics, due to its direct relationship to professional life (Al-Mashhadani: 2011: 71).

Mathematical skills are among the basic and important skills in the life of the individual in the learner's acquisition of what qualifies him to enjoy independence in dealing with his community and to rely on himself in solving his problems. (Meyer-Landenberg et al., 2004).

III. Aim Of The Research

1- Knowing the effectiveness of a teaching-learning program according to the anchors of learning in acquiring mathematical skills for fifth grade female students.

IV. Research Hypothesis

To achieve the aim of the research, the following null hypothesis will be tested:

1- There is no statistically significant difference at the level of significance (0.05) between the mean scores of the experimental group students who will study according to the educational-learning program and the average scores of the control group students who study according to the usual method of teaching in the post-test in acquiring mathematical skills. .

V. Research Limits

1- Fifth-grade female students in daytime primary schools in Baghdad Governorate for the academic year (2020-2021 AD).

2- Topics of the mathematics book to be taught in the first course for fifth-grade female students in Iraq for the academic year 2020-2021 AD.

3- Mathematical skills (writing large numbers, adding and subtracting large numbers, multiplying numbers, dividing numbers, decimals).

Define Terms

1- The educational-learning program was defined by :

• **(Darwaza, 2000)**

It is a field of study and research related to the description of theoretical principles and practical procedures related to how to prepare educational programs, curricula, educational projects, and all educational practical lessons in a way that achieves the set educational goals. (Darwaza, 2000: 78)

• **(Faraj, 2005)**

It is: "A tight plan for coordinated action, or a series of pre-prepared operations that form an integrated educational process in its group" (Faraj, 2005: 150).

• **(Saad, 2006)**

An information system and practical educational activities that operate under specific conditions and instructions that include content, activities, and elements that are presented in an accurate scientific manner and

educational and evaluation methods according to the objectives of the program, taking into account the characteristics of the learners (Saad, 2006: 4).

Theoretical definition of the educational-learning program: It is an organized planning of study subjects according to specific steps to achieve various educational goals.

The procedural definition of the educational-learning program: an integrated, organized plan that includes a set of topics designed according to the learning anchors (the independent variable in the research) in acquiring mathematical skills for fifth grade female students.

2- Learning Anchors: Known by :

• (1997) yihshyu,

A model for learning designed as problem-solving situations that follow the constructivist school curriculum based on technology, with the help of interactive video discs and computer technologies. It represents situations from daily life in a storytelling manner. their problem-solving skills.

(6: 1997 yihshyu,)

• (2016 , Freed & et al)

An educational environment rich in educational situations based on the use of technology in learning and it falls within the social constructivist trend and includes situational learning that promotes problem solving in an integrated educational context. In other words, learning takes place in a context that provides real roles for learners that enhance the learning process. (2016:55, Freed & eta). (,

The theoretical definition of learning anchors: It is a form of problem-based education that includes foundations and principles that employ various and different capabilities, and is applicable in educational situations, providing learners with non-traditional methods, and working to help learners acquire problem-solving skills and enhance their self-confidence .

The procedural definition of learning anchors: an educational learning approach that allows fifth-grade female students to acquire mathematical skills through video presentations that contain mathematical stories in which events are linked as an anchor after dividing the students into groups to solve problems, and then each group presents the information it has found. Which enhances their learning.

3- Mathematical skills were defined by:

• (Al-Huwaidi, 2006)

It is the work to be done accurately, quickly, correctly, and in the shortest possible time. (Al-Huwaidi, 2006: 28)

• (Al-Khatib, 2011)

It is the routine way of doing something and the ability to do something quickly, accurately and with perfection.

(Al-Khatib, 2011: 268)

The theoretical definition of acquiring mathematical skills: the learner's ability to perform a mathematical task such as writing a number, drawing an engineering figure, or finding the result of applying a law or others quickly and with minimal effort.

The procedural definition of acquiring mathematical skills: It is an intentional, organized activity that expresses the practical performance of the research sample students in writing large numbers, finding a product, adding and subtracting large numbers, multiplying numbers, dividing numbers, writing decimals, determining the place value, and it is measured by the degree that you get The student in the test prepared for this purpose.

VI. Theoretical Background:

*** (Learning Anchors)**

The educational environment based on learning anchors is a model for the educational interaction environment that is designed to stimulate and develop learners' thinking, as well as their skills and attitudes necessary to solve problems effectively, as learning anchors help students understand the types of problems, through repeated exploration of the same situation from multiple sides (Crew , 1998: 944).

Learning anchors are a method of learning that relies on employing technology to place learning within the context of solving a meaningful problem (Sener, 2013 : 5).

And it works to establish education within meaningful situations (known to the learner), so that it arouses the learner's interest, and enables him to identify and distinguish problems, and explore content from several different perspectives. (Chapman, 2014 : 59)

The learning anchors aim to apply knowledge in solving life problems. Seeing the learner how to apply knowledge in solving real-world problems can increase his interest and effort in the learning process, which facilitates his recall of information when facing another similar problem in the future, which helps to improve Its achievement in multiple applications (Crew, 1998, : 944).

Education stages according to learning anchors

Learning anchors have several stages:

The first stage: an introduction is presented that arouses the interest of the learners through the use of presentation tools such as video tapes or CDs that contain a complex problem and well-established information that helps to solve the problem. Learning can be achieved with the participation of the teacher with the learners.

The second stage: introducing the learners to the nature of the problem and making the learners discover basic concepts to solve the problem, and the learners develop and develop the participation experience, so the teacher leads the discussion process, and then their information increases.

The third stage: Learners increase their knowledge through research to reach constructive ideas to solve the problem.

The fourth stage: the learners benefit from their knowledge and information as tools for solving problems, and the teacher helps them in this stage by providing them with knowledge sources to solve the problem.

The fifth stage: make the learners identify how to apply the concepts and move to solve these problems, and the learners participate in solving the problem through groups.

The sixth stage: the learners explain what they have learned and how each learner solves the problem compared to his colleague, identifying strengths and weaknesses, and dividing solutions for each of them. (Zaitoun, 1990: 89)

Requirements for successful learning anchors

McLarty et al. (1989) put forward seven factors to guide the design of learning anchors:

1. Choosing the right anchor: This includes deciding the educational objectives based on which anchor is selected and which enables it to function in a particular group of learners.
2. Developing common experiences about the anchor: This means that learners are given the opportunity to see the parts or sections of the anchor, to understand and organize the information, and to further improve their experience.
3. Expanding the anchor: If one anchor is not useful or sufficient to achieve the educational objective, an additional anchor should be used to help learners better understand the subject.
4. Using knowledge as a tool: When learners acquire knowledge, it is very important to allow them to understand how to use that knowledge while giving learners the necessary guidance to apply what they use.
5. Teaching or teaching using the anchor: Teachers should work publicly to link the anchor with the educational goals in order to increase the ability of learners to apply what they use in that anchor so that their learning is objective.
6. Integration of the anchor: Learners must be able to use their real knowledge and skills when learning through the anchor, and this makes them more active learners.
7. Allowing learners to discover: Allowing learners to discover the anchor can contribute to developing a sense of experience and sharing it (Kohler & Harris, 2009:393-416).

Advantages of learning anchors:

1. The anchors of learning are important in activating deep and effective thinking, and it helps individuals to think in a practical and effective way, by appreciating and evaluating the information that is presented to them through this education.
2. Helps the learner in the development of useful knowledge and information rather than latent knowledge.
3. The focus is on the importance of forming or creating a firm or grounded concept that generates interest and enables the learner to identify and pay attention to problems and develop their awareness.
4. It makes the learner focus on the important aspects of the subject and the problem under study and enables them to look at the situation from multiple points of view or new angles.
5. The strongest and most obvious feature of learning anchors is the use of complex real-world contexts to provide meaning and reasons why the information is useful.
6. The anchors of learning provide the acquisition of both knowledge and skills that are usually taught abstract from texts.
7. Acquisition of problem-solving skills such as problem formulation, related information and discovery, to a greater degree than learners who solve problems with separate words unrelated in context.
8. Using the anchor position for learning provides teachers with an opportunity to direct learners' attention to the curriculum (higher-order thinking skills) and hard information available in a particular domain.
9. The anchor position provides an opportunity for the transfer of education across the various academic fields related to the educational situation.
10. The work in a complex realistic context will be surprising and motivating for the learners, adding a new experience of clairvoyance and gaining knowledge and vision from several angles.

11. The anchors of learning allow looking at new horizons and acquiring new understandings that one did not know, and indeed it can be considered cognitive education, and based on the concepts of ecological psychology, the experiences of learners working in the context of the JASPER program can be viewed as “adjusting their attention” to “see” the context from different perspectives. (Miller & Gildea, 1987:94-99).

Disadvantages of learning anchors:

- 1- Difficulty choosing the appropriate teaching method in learning anchors.
- 2- The large financial cost of this theory and its time-consuming preparation.
- 3- The difficulty of choosing learning anchors (video, audio, image and music) that are appropriate for the subject.
- 4- It is more difficult to cover a broad topic or issue or a method that is not predetermined. (Swanger, 2012: 7-8)

*** Mathematical skills**

Learning and developing skills is one of the important aspects of learning any subject, not just mathematics, due to its direct relationship to the individual’s career, and mathematical skills are forms of mathematical content, each with its own set of procedures, and learning requires accuracy, speed, and understanding (Al-Mashhadani, 2011: 71_ 72).

By mathematical skill, we mean a group of actions carried out by the student, whether it is manual work such as eating and using engineering tools, or procedural work such as arithmetic, algebraic and engineering operations, or mental work such as solving mathematical issues and problems, provided that this is done accurately. (Hisab Allah, 2001: 7)

It is an essential part of the objectives of teaching mathematics at all educational levels in almost all countries. If students do not develop their mathematical skills, their learning of mathematics will be affected negatively and to a large extent. It is not enough for students to know how to perform the four arithmetic operations on rational numbers, for example. Rather, they must develop their skills to conduct them if they want to make significant progress in learning mathematics. (Al-Faraj, 1993: 2)

And they are the basic building blocks of mathematics closely connected to form the integrated structure of mathematics in concepts, the basis for the formation of algorithms and skills, and a set of algorithms and skills can lead to the formation of principles, generalizations, applications and mathematical issues that support their learning. (Qasim&Ma’ad, 2019: 93).

Types of mathematical skills:

Teaching skills is very similar to teaching knowledge, as it also depends on memorization and repetition and requires speed and accuracy in performance

A_ Sensory skills: Sensory skills are represented by the use of mathematical tools and machines, such as the use of rulers, compasses, protractors, calculators, etc. Laboratory methods may be suitable for teaching sensory skills in the early stages of education, where students do some activities that give them skills in using these tools.

B_ Semi-sensory skills: These skills are represented in drawing shapes, mathematical curves, statistical columns, and various measurements to measure the length of a straight line. Drawings or measuring angles. Semi-sensory skills are often acquired by the student automatically, through training and practice.

C_ Abstract skills: It is dealing with facts, information, and mathematical generalizations in a routine manner stripped of its sensory or semi-sensory background. Algorithms require accuracy and speed in performance, ready for development for direct use, hence they need a kind of training and practice, but this training or that practice must be after understanding and after the meaning of the algorithm is formed by the learners. (Al-Mughira, 1989: 120_ 121)

He believes (Shehata, 1999: 200) that the actual teaching of skills includes five stages, in order:

- 1- Skill analysis.
- 2- Evaluation of the initial behavior of the learner.
- 3- Training on units and elements of primary skills or capabilities.
- 4- Describe and present the skill to the learner.
- 5- The learner's practice of the skill. (Shehata, 1999: 200)

When analyzing any skill, the teacher should take into account the following matters. (Al-Khatib, 2011)

- 1- Determine the importance of the skill
- 2- Updating the logical progression steps to perform the skill
- 3- Describe the method of performing the skill accurately and gradually.
- 4- Determine the degree of acceptance of appropriate performance based on established criteria. (Al-Khatib, 261: 2011).

Reasons for learners' weakness in acquiring mathematical skills

Reasons for learners' weakness in acquiring mathematics skills

A number of reasons mentioned by (Abu Asaad, 2009) are reasons for students' weakness in acquiring mathematical skills, including:

- 1- Lack of enough time to train skills
- 2- Lack of understanding of the mathematical concepts and generalizations on which the skill is based
- 3- Technological development and the emergence of computers and the like led to a lack of interest for some learners in acquiring mathematical skills.
- 4- Not using effective methods in teaching mathematical skills.
- 5- The learner's lack of pleasure and readiness towards mathematics.
- 6- The weak ability of the learners to deal with abstract ideas and symbols, and the lack of interest in achieving the necessary competencies. (Abu Asaad, 2009: 169).

VII. Previous Studies

Study (Rahma, 2017): "The effect of employing differentiated teaching on the development of some mathematical skills and the attitude towards it among female eighth grade students in Gaza." The study was conducted in Palestine, where the sample of the study was 70 students. Arithmetic means and the t-test were used to find the results, as they showed that there were statistical differences in favor of the experimental group in the mathematical skills test, and there were no statistical differences between the control and experimental groups in the attitude scale.

Study (Al-Jubouri and Bashaer, 2018): "The effect of Deniz's model on the development of mathematical skills among fifth-grade female students." The study took place in Iraq, where the study sample consisted of 46 students in the primary stage, and a mathematical skills acquisition test was prepared, where the te-test was used to find the results It showed statistical differences between the pre and post tests of the experimental group and the pre and post tests of the control group, as well as the presence of statistical differences between the control and experimental groups in the post test in favor of the experimental group.

Search procedures

The two researchers adopted the experimental design with a pre and post test for two groups (experimental and control) with partial control, as shown in Table (1):

Table (1) Experimental design

group	parity	independent	affiliate	Search tool
experimental group	Prior knowledge			
the control group	Previous collection - IQ test Parents' educational level	Learning tutorial	Acquisition of sports skills	Mathematical skill acquisition test

Research community

The research community consists of fifth grade female students in the day schools affiliated to the General Directorate of Education of Baghdad / Al Rusafa for the academic year (2020-2021 AD), and since the research requires knowledge of the effectiveness of an educational educational program according to the learning anchors in acquiring mathematical skills among fifth grade female students Primary school, so the research sample was chosen from the fifth grade female students at Hatem Al-Taie Elementary School of the First Rusafa Education Directorate.

Table (2) Distribution of the research sample

the group	div	total number of female students	number of excluded students	number of female students after exclusion
Experimental	C	33	7	26
control	D	34	8	26

Equivalence of the two search groups

The two groups were rewarded with a number of variables, namely (chronological age calculated in months, previous achievement, grades of the first course, previous knowledge, intelligence). The three variables, which means that the two groups are equivalent to the above variables. Fourth: Research requirements

- Determining the scientific subject: The scientific subject to be taught was determined in the first semester (large numbers), the second semester (adding and subtracting large numbers), the third semester (dividing numbers), the fourth semester (number division) and the fifth semester (decimal fractions).
- Analysis of the scientific material: The scientific material was analyzed, the main skills were extracted, and presented to a group of specialists, Appendix (1), and modified according to their valuable observations.

Determining the behavioral goals: The goals for teaching the subject were set in the form of behavioral goals according to the six levels of Bloom's classification in the cognitive field. They were presented to a group of specialists and a percentage of agreement was taken on each goal and approved in the educational program and teaching plans.

The educational-learning program: The educational-learning program has been prepared according to the following steps:

The first step: writing the educational learning program as described by the literature and sources written on the topic.

The second step: presenting a model of the educational learning program to a group of specialists.

The third step: testing the educational program from outside the research subject on a sample outside the research sample from the same community.

The fourth step: reviewing the prepared learning educational program and amending it according to the opinions of specialists and the observations of the experimental sample and producing it in the final form.

- Preparing teaching plans: (13) teaching plans have been prepared for each group, presented to a group of specialists, amended and finalized.

Fifth: Research Tool: The Mathematical Skills Acquisition Test was prepared as follows:

It was agreed to analyze the content and identify a list that includes (23) basic skills.

In order to ensure the validity of the skills list and its suitability for the content of mathematics, and to ensure the relative weight of each skill, it was presented to a group of arbitrators specialized in the field of mathematics teaching methods, measurement, evaluation and psychology, then the arbitrators' response was analyzed using the percentage and the level of significance (0.005), and it was found that the skills Acceptable for obtaining an agreement rate (80%).

30 multiple choice items and 15 essay items were formulated, thus the test included (45) items.

The test included a set of instructions that help students on how to answer the test paragraphs with an illustrative example of the answer being mentioned, and a key for correction was set, in the substantive paragraphs a score of (1) is given in the case of choosing the correct alternative, and (0) in choosing the wrong alternative or leaving the paragraph without answer.

As for the essay paragraphs, the scores ranged from (0-10) degrees, and the validity and reliability of the test and the psychometric characteristics were extracted, and they were all statistically acceptable.

Application experience:

The application of the research was started with the beginning of the second course of the academic year 2021-2020 on 6/2/1/2020, and the variables were equalized on 9/12/2020, with four classes per week in attendance and 3 electronic classes with a total of (26) teaching plans by one of the two researchers and by Then applying the post-test of acquiring mathematical skills to the two groups on Sunday 11/2/2021.

Statistical methods:

The researchers used the appropriate statistical methods, which are the difficulty coefficient equation, the excellence coefficient equation, the effectiveness of alternatives equation, the chi-square test equation, the KR20 equation, and the t-test for two independent samples, as well as the spss statistical package.

Presentation and interpretation of the results

After conducting a test for the acquisition of mathematical concepts for the experimental and control groups from the two research groups (control and experimental) and correcting the students' answers for the mathematical skills acquisition test items, the results of the t-test statistical analysis of two independent statistical samples showed as shown in Table (5):

Table (5) the results of the test of the control and experimental groups in the post-test for the acquisition of mathematical skills

skill	group	number	Rank average	Mann Whitney value	z-value	significance is at the level of 0.05
Writing big numbers	Experimental	26	29,42	262	1,422-	1,96
	control	26	18,27			
Addition and subtraction of large numbers	Experimental	26	28,63	282,5	1,033-	
	control	26	24,37			
multiply numbers	Experimental	26	27,08	323	0,282-	
	control	26	25,92			
Divide numbers	Experimental	26	30,85	225	2,135-	
	control	26	22,12			

Decimal fractions	Experimental	26	31,54	207	2,469-	
	control	26	21,46			

Which indicates that there is no statistically significant difference in the skills acquisition test for female students of the two research groups, and thus the two research groups are equivalent in this test.

effect size

To find out the effect of the educational-learning program according to the learning anchors on the acquisition of mathematical skills, the effect size calculation equation was used to calculate the effect size of the independent variable, which is (the educational-learning program according to the learning anchors) on the dependent variable, which is (the acquisition of mathematical skills), and to ensure that the size of The resulting differences using the Mann-Whitney test are real differences due to the independent variable and not to other variables, as the effect size is determined if it is large, medium, or weak, as shown in Table (6).

Table (6) the effect size of mathematical skills

independent variable	Dependent variable (mathematics skills)	effect size	magnitude of the effect
A learning program based on learning anchors	Writing skill	0,22	great
	Addition and subtraction skills	0,16	great
	Multiplication skill	0,04	weak
	Division skill	0,33	great
	The skill of writing decimal fractions	0,39	great

As the size of the effect of acquiring mathematical skills was (0.63), and for this reason, the effect of the educational-learning program according to the learning anchors in acquiring mathematical skills is high.

Interpretation of the results

The presented research results showed that there is a high effect size in favor of the program in the mathematical skills acquisition test, and it may be attributed to one or more of the following reasons:

- 1- Teaching according to the program and its strategies and models that helped the students to use many activities and mathematical stories with open endings in new situations by collecting the information given and linking it among themselves to reach a solution.
- 2- Educational attitudes in solving different activities, all of which helped to motivate the students to carry out a variety of activities that increase their understanding of the characteristics of numbers and operations on them and develop their mathematical skills.
- 3- The educational learning program according to the learning anchors takes into account individual differences and gives the students the opportunity to re-understand the topics and their applications, and thus the possibility of building knowledge in a better and easier way.

Recommendations:

- 1- Presenting the educational material to the students in the form of problems and stories that have an impact on their lives, which encourages the interest in the material with passion and enthusiasm.
- 2- Moving away from stereotypes in teaching that lead to passive knowledge, and moving from the indoctrination method used in educational institutions to using proposed programs based on (effective learning).
- 3- The necessity of linking the applied practical side with the theoretical side in mathematics, and linking it to the lives of learners.
- 4- Paying attention to mathematical skills and employing them in life because they are the basic and cognitive building blocks of mathematics in the primary stage.
- 5- Employing the different strategies of the educational-learning program according to the learning anchors in acquiring mathematical skills.

proposals

- 1- Conducting a study similar to this study in other dependent variables, such as (solving mathematical problems, mathematical thinking, creative thinking, and the attitude towards mathematics).
- 2- Conducting a diagnostic and remedial study of mathematics to determine the inactive mathematical knowledge of primary school students.

Reference

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