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# The impact of a proposed strategy according to interactive learning techniques on the achievement of middle school students in mathematics

Azhar Ibrahim Dhari<sup>1</sup>, Prof. Dr. Ilham Jabbar Faris<sup>2</sup>

1) College of Education for Pure Sciences - Ibn Al-Haytham, Baghdad, Iraq.

2) College of Education for Pure Sciences - Ibn Al-Haytham, Baghdad, Iraq

## Abstract

The aim of the research is to study the impact of a proposed strategy according to interactive learning techniques on the achievement of middle school students in mathematics

, by verifying the following hypothesis:

There are no statistically significant differences at the level (0.05) between the average scores of the experimental group that studied according to interactive learning techniques and the average scores of the control group that studied according to the usual method in the mathematics achievement test.

The semi-experimental design with partial control was approved by the post-test, and the research population is determined by the first-grade students average for middle and secondary government day schools for boys in Baghdad Governorate (Al-Karkh Al-Awwal) for the year (2022-2023), and the research sample was (63) students, with (33) students for the experimental group and (30) students for the control group. The two groups were rewarded with the variables (chronological age, previous achievement of mathematics, intelligence test, previous mathematical knowledge) and the research requirements were prepared (determining the scientific material, formulating behavioral objectives, preparing teaching plans and analyzing the content ), Difficulty and effectiveness of alternatives were calculated, after completing the teaching of the scientific subject, which The second semester of the academic year lasted (5 classes) per week for each group. A post-test was conducted for the two groups in the above tool. The data were processed statistically manually and by adopting the statistical bag program (SPSS).

## .Keywords

interactive learning techniques, achievement, attitude towards the subject.

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**Corresponding author(s):** Azhar Ibrahim Dhari

**Contact address:** Azhar.darei2103m@ihcoedu.ubaghdad.edu.iq

## Introduction:

Education suffers a lot of the problems, and one of these problems is the usual teaching methods used and its lack of diversity, which in turn may lead to a decrease in the level of students' motivation towards the scientific subject, as part of the loss of motivation falls on the teaching method and the large part is borne by the teacher, the curriculum and the learning environment, and all of this may lead to students losing the element of excitement and suspense to study that subject. This is what makes students take a fixed pattern in education. Because they are recipients of information from one academic stage to another without making any change in the methods and methods of their teaching, which may make the majority of students deal with the study material without any emotional interaction, and this may lead to aversion and boredom from studying, and the matter does not stop at this point, but rather this may sometimes lead to the formation of negative and undesirable attitudes towards the teaching staff and the school in general, and this is one of the reasons that may lead to a decrease in the level of academic achievement. Orientation towards mathematics Both indicated (The greatest And Jasem, 2019) And (Hasan, I.F & Faris, EJ (2020)) And (Hasan, I. F & Faris, EJ 2019) And (Al-Aqabi & AL-Kadhimi (2023)) to the fact that the use of interactive methods in teaching mathematics may be effective in improving abilities and academic achievement, which are goals that mathematics seeks to achieve. The emergence of modern concepts in teaching and the concept of integrating educational environments has played a role in the emergence of the need to move towards interactive education in teaching mathematics as an urgent need to develop thinking skills and types of intelligences, and this is indicated by a study (2021).elt&Jawad, L.F.,) and study (Hassan, DAK 2018.) and study (Hassan, AK 2017.) and study (Majeed, BH, 2022)) Because at the usual method not seen to develop an orientation towards mathematics and it is a real problem and a solution must be found, and this is what the researcher concluded, From her experience of being a teacher of this subject in the stage Medium for seventeen years and after listening to the opinions of male and female subject teachers mathematics During her visit to some high schools and Medium Affiliate research community and follow up the students According to the book to make the task easier, It was found that there is a clear weakness in students' achievement in mathematics In addition, the researcher surveyed the opinions of a group of teachers cross Resolution, submitted to (20) a male and female teacher from a subject teacher mathematics for class The first is average.

Depending on what may already come This research is an attempt to find out Effect Interactive learning technologies achievement and attitude towards mathematics, The research problem was identified by answering the following question:

what effect A proposed strategy according to interactive education techniques In collecting Middle school students of mathematics and their attitude towards it?

Second: the importance of research

A number of researchers stressed the importance of overcoming learning difficulties that spread among students, as they have a significant impact not only on learning mathematics, but also extend to other academic subjects, which leads to serious effects that affect the students' personality and their attitude towards learning mathematics (Al-Aqabi, Elham Jabbar Fares: 2015).

And Prepare Mathematics An important specialty related to all sciences other, And most importantly, its teaching, which is one of the most difficult types of teaching in terms of preparing and qualifying teachers and developing students to reach the highest level in the achievement of a

subject.mathematics (Hamdan,11:2005).

Since mathematics Building material and nucleus entered into many domains, It combines difficulty on the one hand and entertainment on the other hand last, Its difficulty lies in the fact that it needs thinking and interpretation analysis, and modalities to organize, And logical style has its role in the advancement of thought and constructive brains, At the same time, it has many characteristics and special and rare attractiveness, and the soul tends to study it (Al-Kubaisi,17:2008).

So see the researcher that necessity to be teacher able to take responsibility complete and competent in his scientific subject; for the success of teaching; For the students of the stage Medium They are of great importance as teachers and leaders the future, So you should pay attention to this category.

Achievement is also a criterion for the level of students and a goal that students aim for in various educational classes, because It is considered an achievement through which many things are based, such as building a person's personality and its development, a sense of satisfaction and self-confidence, self-affirmation, a sense of control, or satisfying the need to discover everything that is new. A function that achieves a kind of stability for the individual, and that the degree that the student obtains is not a deaf degree as it seems to some, but it reflects and pronounces many vital and important matters for the learner, and that achievement is not just results, but rather one of the most prominent results of the educational process, so it is seen that it is The basic criterion through which it is possible to determine the academic level of students, judge the educational production in quantity and quality, and stand on everything that happens during the educational process in terms of results and effects that result in building the personality of the learner.

(Hamdan, Fatah Khalil, 2005)

Academic achievement is also one of the basic things that reveal academic excellence through school records (grades achievement), and because achievement represents one of the manifestations of mental and functional activity among individual, Achievement is also of great importance to the teacher when he can predict the relative behavioral patterns of some learners, which makes him more efficient and effective in performing his role with them (Katnani et al.,2009: 48).

The researcher believes that That it is necessary to know the effect of use A suggested teaching strategy according to interactive learning techniques Teaching mathematics and its relevance With the educational environment in Iraq and the characteristics of the learners, taking into consideration consideration Educational content and it can be said that search Current gaining importance from the importance of mathematics And the importance of interactive learning techniques

### **In addition to the foregoing, the importance of the current research can be clarified**

- أ- It may benefit teachers in how to use the proposed strategy according to interactive education techniques and employ them in teaching mathematics.
- ب- It may benefit researchers in addressing new approaches related to strategy HSuggested according to interactive learning techniques
- C - Teachers and researchers can benefit from the achievement test and the measure of attitude towards the subject.

### **Third: Research objectives**

The research aims to identify the impact of a strategy **Proposed according to the techniques of interactive education in the achievement of middle school students of mathematics and their attitude towards the subject**

This is by checking health hypothesis following fig:

- The first null hypothesis states: There is no difference in statistical significance at level (0.05) with men. The average score of the experimental group who studied according to proposed strategy in accordance with Interactive Learning Technologies and mean scores of the control group who studied according to the usual method in the achievement test for the subject mathematics.
- The second null hypothesis states: There is no difference in statistical significance at level (0.05) with men. The average score of the experimental group who studied according to proposed strategy in accordance with Interactive Learning Technologies and mean scores of the control group who studied according to the method traditional in Orientation scale Article of mathematics.

#### **Fourth: Research limits**

- 1- The first is average in secondary schools and diurnal medium Government affiliated to the General Directorate of Education in Baghdad / Karkh Governorate for the academic year (2022/ 2023).
- 2- Chapters V (Engineering), VI (Measuring areas and volumes) from the mathematics textbook for the first intermediate grade of the year scholastic (2022/2023).

#### **Fifth: Define terminology**

##### **The strategy Strategy**

- Attia recognized him (2008) that it is "A specific progress plan in order to reach the goals, and that plan includes the basic steps that the teacher has set for the purpose of achieving the goals set for the curriculum" (gift, 30:2008)

The strategic researcher is procedurally defined as: A set of procedural steps undertaken by the researcher inside the classroom to implement the teaching process with perfection in order to achieve predetermined teaching objectives for the prescribed mathematics curriculum according to the available capabilities.

##### **Interactive education**

- **Arafa Al Saifi (2018)** It is an educational method based on the interaction between the student and the teacher and the students communicate with each other through the use of advanced modern technologies to transform the study environment from a traditional one to a positive interactive one (Al-Saifi, 2018: 238).
- **known by the researcher Procedurally:** It is the direct and indirect interaction between the teacher and the students. All students interact with each other at the same time through joint

interactive dialogues directly with sound and image, common screens, electronic boards and information, and they can be stored and used again

### **Attainmentachievement**

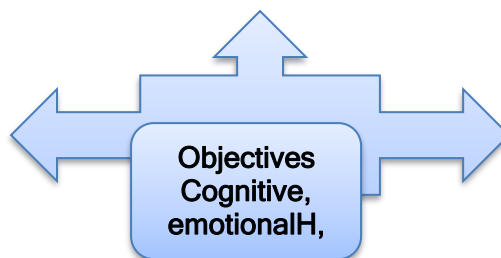
Al-Fakhri (2018) as: The KnownAcquired by the learner or that has grown with him through learning the academic subjects, and it is measured by the degree that the student obtains (Al-Fakhry, 2018: 8)

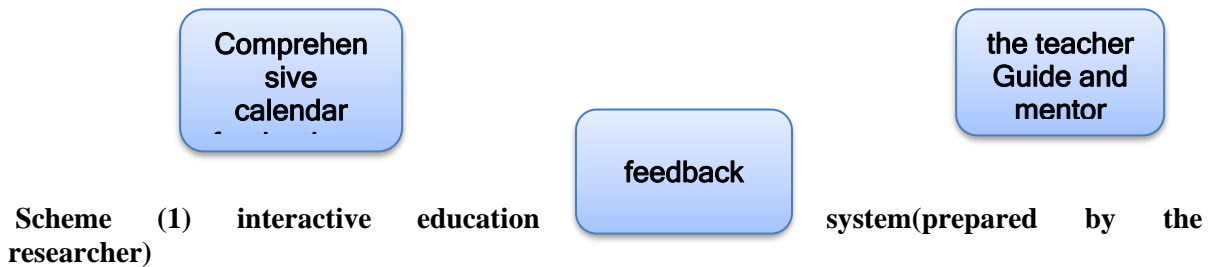
The researcher defines it procedurally: it is the outcome of what she providesrequester (The research sample)Information and skills after learning a subjectmathematicsIt is measured to what extentjhe got it In the achievement test prepared by the researcher for research purposes

- **backgroundtheory:**educationInteractive

It was noted that in the 1990s "active learning" became a buzzword in scholarship about teaching, learning and education. But the phrase would be misleading. When a student learns something, he isnThe learner is somewhat active perhaps not physically, but certainly mentally. In other words, it doesn'tDrEducation called "negative education". Therefore, as interrelated processes, physical and social activity is often associated with mental activity and can therefore aid in learning. Thus, the more appropriate term is "interactive education", which includes all methods of students' meaningful engagement with materials that help students interact with others. (teacher and classmates) and with themselves. (1991,Bonwell and Eison):

study indicatesTAnd scientific research conducted in this field that the student's ability to Turkishg diminishes after 10 minutes, and this naturally includes a decrease in the amount of information that the student can retain (Awwad and Zamil, 2009), and this requires a real change in the roles of the teacher and the learner, through activating their roles, so that the learner is the focus of the educational process within the classroom, so he participates in the educational process, and practices things that force him to think about what he is learning (Atef, 238, 2009). Through the above, we find that interactive education pushes the student to have an active role and not just a recipient of information, as in the traditional lecture in which the teacher presents information and knowledge and the students listen to what the teacher says, without initiative or participation.. in creating real education, and where it consists The interactive education system consists of a variety of goals (cognitive, emotional and skillful), and the teacher has an interactive guide and mentor, feedback, and then a comprehensive evaluation of the three aspects of the goals, as shown in Scheme (1).





### Interactive Education Philosophy:

Referred to as the philosophy of interactive education is that it is based on a set of contemporary global and local variables, and it is considered a response to these variables and calls for transferring the focus of attention from the teacher and making the student the focus of the educational process. He believes that one of the theories that support the activities of the learner is the constructivist theory, which believes that each student forms his knowledge of himself, either individually or collectively, based on his current knowledge and previous experiences. This can only be done through interactive education. Piaget, in most of his educational writings, called for interactive knowledge, which he considers important in developing the mind, mental processes, and cognitive structures of the student. (Badawi, 2010).

### \* Education Technologies \*

I have back term Education Technologies in beginning a contract The nineties, and take to hesitate a lot after Results good that achieve it and appearance excitement positivity in to support the operation educational And he has invest education this progress from during Benefit from This is amazing techniques inside the hall tuition And in Laboratories as well in the activities methodology extracurricular many from interested in this field from Okay to exploit what I came up with mechanism technology the computer software and communications in Establishing System education flexible and smooth Supported interactive Techniques and software reality Free default to keep abreast of rapid developments in modern technology to guarantee follow them and interaction with her to serve the society, And he has mirror that on changes quick and successive in technology And need learner and environment that He lives In which.that Development Whopper in Technique the information and communications as much what facilitate for the learner get on the information required increased With the same the time on him Familiarity with skills a lot And renewed.that need learner to a base wide from the information that contribute in Strengthen Specialization had become possible in the time the present And from during Education Technologies (Abdul-Majeed and Al-Ani, 2015: 23)

### There is many from techniques used in education interactive, Such as what Come:-

**storming mental** : get up educated people usually conducting sessions from storming mental interactive, And consider This is amazing the operation useful to generate thoughts creative, as help This is amazing method on link the information Some of them with each other, include Species storming mental Interactive organizer And change organizer, And think reverse or passive, and interaction via Internet, like: chat and forums, and mail Electronic brainstorming has been defined idiomatically as: an attempt to collect ideas on a specific topic within the maximum possible energies, and it comes by stimulating the motivation of the student, and motivating him to extract ideas related to the subject (Ashour and Abdel Rahim, 2004: 297)

proposed strategy

\* After this theoretical background on interactive education and educational techniques, the

researcher suggested her strategy represented by the following steps:

### **steps The strategy suggested**

1. First:-Submit a video Displays requirements Lesson Topic with the definition subject Present.then Subtract a question specific Requires from requester the answer He and also the student, if he has a question about any vague point, the student writes the question and puts it to the teacher. then during the lesson He presents Students the answers in a form scraps paper collect it teacher then Repeat distributed on Students in a form random And it begins by taking answers Students and discussed them and answer their questions to connect to the answer correct to ask
- 2.secondly:-Complete to explain the topic from before teacher an explanation regular included(Discussion,dialogue collective,offers charade.stories and anecdotes(using the blackboard Interactive And the info Krav
- 3.Third:Solution matters exercises Mathematics using break thinking with Discussion and dialogue And storming mental and configure assumptions and put Solutions Occasion
- 4.Fourthly:in Conclusion the lesson Use Maps mental electronic phrase one Just
- 5.Fifth:in the duty home supply The student with a short simplified video through a channel for students knows with a subject the lesson Next with presentation A question for the students about the topic, which the student answers with a piece of paper, and also the students have to ask the teacher about any vague point he has about the topic of the lesson.

### **achievement**

Knowledge and learning are essential human life, Through it, humanity advances, nations rise, and peoples excel. Learning is seen in our contemporary world as a process of change and development because of its positive effects in advancing society.upgrading,Academic achievement is one of the most important aspects that motivates the mental activity that the student performs, and its impact is evident in the academic excellence that he obtains (Al-Shammari,2011:40).

The academic achievement ofThe hardest challengesWhich meets those in charge of the educational process, because it is one of the topics that occupies the thinking and efforts of scholars of education and psychology (Al-Zayyat,1995:315).

sobe seengunpowder (2010)Achievement is “achievement by answering a test that is set after acquiring knowledge, information, values, attitudes, and facts related to the cognitive, motivational, and social aspects by setting up an organized mechanism, whether in the school or the educational body, and this learning is inferred from the grades that students obtain in the tests.” regulated and attainable” (Gunpowder,2010)

### **Orientation towards Mathematics:**

**Marano sees** (.1991,Maranon). The learner's attitudes and perceptions are what they are Each of his experiences, he soldzAttitudes affect learning in a positive way, and some of them increase the difficulty of learning. One of the main meanings in education research is that the attitudes and perceptions of the learner play a fundamental role in the learning process.(Hajjat, 2010).

### **Direction Components:**

Although the concept of trend is a broad concept, the trend theorists have analyzed this concept. It is known that man has three aspects, the first is knowledge, the second is feeling, and the third is action, and these three aspects of man are fully reflected in the three components of trend, which can be presented as following:

- 1- **Cognitive component:**This component indicates the cognitive aspects that involve the student's point of view related to his attitudes towards the subject of the trend. The cognitive framework of these stimuli is formed, and the student's attitude is formed if he is able to obtain a measure of knowledge and information about the subject of the attitude.pTo take a

specific position, whether positively or negatively, on an issue that does not matter something about him.

- 2- **Affective component:** This component refers to a general emotional method that affects the response of accepting or rejecting the subject of the trend. After the student has become acquainted with a set of information and knowledge about the subject of the trend, he has some sensations and feelings that are manifested in the extent of the individual's support or lack of support for a particular position, and these feelings depend in terms of their intensity. It depends on the degree and quantity of information that the student acquires, and this component is the most important of the three components of the attitude.
- 3- **behavioral component :** This component refers to the tendency of the individual to behave according to specific patterns, in certain situations. It also refers to the extent of interaction between the cognitive component and the emotional component, so that he becomes more inclined to adopt a specific behavior towards the subject of the trend, so that his behavior and behavior express the set of beliefs and feelings that he has formed. The student's behavior and inclinations are an expression of the balance of his knowledge of something and his passion associated with this knowledge. Therefore, the attitudes act as directives for the individual's behavior as they push the student to work according to the direction he adopts. The student who has receptive tendencies towards mathematics, for example, seeks to participate in scientific activities and perseveres seriously and effectively. (Saraya, 2007: 264-266)

**Measurement modalitiesdirection:Measuring a trend means converting it from descriptive form(with)or(against)into a quantitative formula on the basis of which students or groups can be compared with each othersome.Mr. and Saad,1999: 264)**  
**Likert method or (collective estimation method):**

This method is based on the ordinal measurement of attitudes, and it is one of the commonly used methods in educational, psychological and social measurement and research, because it does not requireBGreat effort and time in preparing it and leads to similar results, as it does not darkenDrOn the evaluation of the arbitrators, as the learner is presented with a list that includes phrases or paragraphs and he is asked to indicate his agreement or disagreement with varying degrees that reflect the intensity of his attitude, and a graded ordinal scale is used, either three or five, or more, but it is preferable not toDrOn five so that the student can move between them and choose the degree of his agreement accurately.

- **Research Methodology and Procedures:**

**First: the experimental design:** The researcher chose the quasi-experimental design (two equal groups) with partial control of the experimental and control groups, one controlling the other partially from those with the post-test for achievement, Table (1).

**Table (1) Experimental design**

dependent variable	the independent variable	parity	the group
1-Achievement test	strategyProposed according to interactive education	1- Agetemporalin months	Experimental



2-Measure of attitude towards mathematics	techniques	2-intelligence 3- Orientation scale 4-a test Previous mathematical knowledge 5- Previous collection	control
	the usual way		

**Second: the research community:**The research population includes students of the first grade average for the governmental daytime intermediate and secondary schools affiliated to the General Directorate of Education in Baghdad Al-Karkh Governorate / the first for the academic year (2022).–2023

**Third: the research sample:** The number of ilapMy search group(69) student,(34)popular student (c) And the(35)divisional student (B) and were statistically excluded (6) a student from both groups; Because heMfrom the precipitateyento own itMExperience in the subject from the previous yearAnd delegates (those who prohibit semester exams only)May affect the results of the experiment while allowing itMperpetuate in my search groups and so onHe isTotal number of ilapa samplesearchin totalt search(63)studentAs in schedule (2).

**Schedule (2) The research sample**

numberthe studentsafter exclusion	numberthe studentsexcludedyen	numberthe studentsbefore exclusion	div	the group
33	2	35	B	Experimental
30	4	34	c	control
63	6	69	2	the total

**Fourth: control procedures**

**ures**

- **Internal integrity of the experimental design:**In order to ensure the internal safety of the experimental design, the researcher addressed the following factors:

**1-ParitystudentsMy search groups:** The researcher made sure that the two research groups were equal in some of the variables that could affect the dependent variables, where the two research groups were equal in the variables (chronological age, Otis-Lennon test of intelligence,measure of direction towards matter,Previous attainmentprior knowledge).

**2- Accompanying accidents:**The students of the experimental and control groups were not exposed to any emergency circumstance or accident that could hinder the progress of the experiment throughout its conduct period, which could affect the dependent variable in addition to the effect of the independent variable, except for travel days, official holidays and celebrations, and the lessons were replaced by other school days, so there were no influence the search results.

**3- Processes related to maturity:**No differences appeared during the experiment periodlapThe two research groups indicate the effect of the maturity factor, so that the time period of the two research

groups is equal during the researcher's observation by follow-up students. lapweekly, due to the short duration of the experiment, which did not exceed two and a half months, and because ilapThe two groups are shownwafor the same period, so this variable had no effect on the experiment.

**4-Experimental extinction):** did notThroughout the course of its conducting, the experiment is exposed to any student dropping out or dropping out or being interrupted Attendance or moving from one division to another or from one school to another, with the exception of cases of individual absenteeism, which the experimental and control research groups were exposed to in very small proportions and almost equal in both groups.

**5- Measuring tools:** The same measurement tool was applied to ilapThe two research groups are the achievement test, and thus the researcher maintained the adjustment process for the research tools ilapThe two groups

**The classroom environment (physical conditions): where** The researcher applied the experiment to DrlapThe two research groups are in the classroom, where the traditional classroom is appropriateto learn, After the researcher reviewed the classroom space, location, lighting, ventilation, as well as the type of blackboard and the type of furniture, as she found them to some extent suitable for the application of her research experience.

**7- Research Confidentiality:** The researcher was keen on the confidentiality of the research in agreement with the school administration and the subject teacher by not informing the studentlapThe nature of the research and its objectives and the application of the experiment so as not to affect their activity or their dealing with the lesson of themathematics, which may affect the safety of the experiment and its results.

**8- Study material:** Scientific article unified for the two research groups, which are (2)two chapters Fifth and sixthmaterialmathematics The first averageto be taught for the semesterthe secondfor the academic year (2022-2023).

**9- Subject School:** The researcher herself studied the two research groups along the length of the experiment in order to determine the effect of the teaching experience to ensure that this variable does not affect the results of the research, which may be caused by the school's difference in its experience and personal characteristics.

- **External safety of the experimental design:** To ensure the external safety of the experimental design, the following factors were addressed:
  1. **Interaction of the experimental situations:** The researcher studied TlapThe two groups themselves in order to get rid of the effect of the experimental procedures, as the experimental groups were not exposed to more than one experimental process during the research period.
  2. **The interaction of choice with experience:** The effect of this variable was minimizedlapThe two divisions were divided into an experimental group and a control group randomly (by lottery method).
  3. **Interaction of experimental conditions:** The researcher made sure to teachstudentsThe two research groups were in natural and non-artificial conditions using one experimental factor (teaching a subjectmathematicusing a strategyProposed according to interactive education techniques for studentsthe

experimental group), and thus there was no effect of the interaction factor of the experimental conditions in the experiment.

**Fifth: Preparing the research tool:** The achievement test was prepared in light of the content of the specific material for the research, and the behavioral purposes for each were determined subject matter, materiality and table of specifications; To measure the achievement of the two research groups after the end of the specified period of the experiment in the subjects that were taught, and the researcher prepared the test

Below is a detailed explanation of these steps:

**Determine the purpose of the test:** This test aims to measure the level of achievement of the research sample for both groups of the cognitive aspect of the chapters specified in the research from the book mathematics Course taught for the academic year (2022-2023)..

**Determine the number of test paragraphs:** toThe researcher's experience in teaching a subjectsportsfor more than17year, andAfter consultingThe researcher is a number of male and female teachersmathematicsThose who study the material to find out their opinions after being informed of the behavioral purposescontent afor seasonsThe fifth and sixth of the mathematics book for the first intermediate grade, It was agreed to determinevertebraetest b (35) test paragraph.

❖ **Drafting test items:** The test items were formulated according to the table of specifications, and the researcher relied on objective testsand frying pan, and hastest consist of (35) test paragraph

- **Virtual validity:** The researcher verified the apparent validity of the test by presenting the achievement test in its initial form to a group of arbitrators, to ensure the criteria for drafting the paragraphs, scientific accuracy, and the consistency of the paragraphs with their behavioral purposes, as most of the paragraphs had an acceptance level of (80%) or more, and the researcher considered them as a criterion for accepting the paragraphs. No modifications, additions, or deletions were made to the test paragraphs, thus achieving virtual honesty. This type of honesty is also called the arbitrators' honesty. .

❖ **applicationreconnaissance:** After ensuring the clarity of the test items and instructions, the test was applied again on a survey sample consisting of (100)studentfromstudentsResearch community without ilapsample, and so onTo determine the psychometric characteristics of the test, in cooperation with the subject teachers.studentsthe date of the test a week before the date of its conduct, and the researcher herself supervised the applicationthe test,The aim of this test is to determine the psychometric characteristics of the test.

❖ **Determine the psychometric characteristicsFor the test:after**Correct answersfor studentsThe second survey sample on the test items, the researcher arranged the scores in descending order from the highest score to theminimum degree, Then I took the two extreme groupsrate(27% of the answers with the highest scores represent the groupsupreme,And the(27% of the answers receivedminimumscores to represent the groupworld,After that, the researcher analyzed the answers of the upper and lower groups statistically to extract the psychometric characteristics of the test as follows:

**Difficulty factorParagraphs:** and Bastequation workersdifficultyfor thematic paragraphsIt was found that the difficulty coefficient for the objective items of the test ranged between(0.352 - 0.444),As for the paragraphsThe pan is donesixWorkers equation Difficulty for the essays of the

test ranged between (0.63–0.74) and so on. The test items are acceptable and their difficulty index is appropriate.

Referring to (Al-Zaher et al. 1999) the test paragraphs are considered good if their difficulty ranges between

(0.20–0.80) (Apparent and other one, 83:1999).

- **Discrimination factor Paragraphs:** And he has Wijdan Factor Discrimination For the subject items, it ranges between (0.259–0.481). and that Factor Discrimination for paragraphs The article ranges between (0.26–0.34),

A paragraph can be considered acceptable if its discriminatory power (0.20) and above (Brown 1981:104)).

Therefore, all test items are acceptable in terms of their discriminatory ability. Delete any of them.

- **The effectiveness of the wrong alternatives to the paragraphs Objectivity:** And yet the application of the alternatives effectiveness equation shows that the alternatives have attracted a number greater than the students of the lower group compared to the students of the lower group supreme. Thus, it was decided to keep the wrong alternatives as they are without changing. And when calculating the effectiveness of the wrong alternatives to these paragraphs by applying equation The effectiveness of false alternatives, the researcher found that it is limited between (0.037–0.222). As it turns out that the alternatives are good because they attracted a lot of people students the group minimum ratio for students upper group,

- **Constancy: And so the stability of the test is extracted in two ways:**

**unless Procedure for the test:** extract researcher H by bag statistic for science Social (SPSS) value Factorial  $\alpha$ -Cronbach To prove that the test contains paragraphs (objectivity and pans) in one. The stability coefficient was reached (0.963) and this is valuable accepted (rotation, 133:1985)).

- **Stability of correcting paragraphs essays :** The researcher extracted the stability of the correction with respect to the article paragraphs by choice (30) papers randomly from leaves answers students. And he corrected it in the light answers typical grade withheld and returned corrected after week from before researcher H. Besides that researcher H to request T from the subject teacher revision leaves itself yet that blocked results a to correct the first about her. And done account link transactions between results. And she was between researcher H and himself a. And through time (0.92) between the researcher H and the other teacher (0.90). This is the stability coefficient of correction for questions spans wella (back, 362:1998).

**Test format Final:** after verify validity Psychometric characteristics of the test keep his paragraphs (27) Paragraph of the type of sister J R who Multi, and eight (8) poverty at Type of questions span and so on had become. The test is ready for use in measuring achievement for total search,

### Measure of attitude towards mathematics

#### Determine the purpose of the test

The research aims to measure **Orientation towards mathematics**. I have two search groups represented by students the line. The first average for the academic year (2022–2023).

#### • Building paragraphs of attitude scale towards mathematics

The objective of the research also includes identifying the attitude of middle first grade students towards mathematics, and to achieve this goal requires the researcher to prepare an appropriate tool, so the researcher built a special scale designed to measure the attitude of middle first grade students towards mathematics, after reviewing a group of previous studies ( Al-Azzawi: 2003), (Al-Utbi: 2006), and (Jalil: 2008) as well as looking at the scale (Twose: 1983 Which he translated (Zeitoun:

1988) into Arabic.  
(Zaitoun: 1988, 108)

All of this helped in the process of preparing the scale for this, as the scale paragraphs amounted to (26) paragraphs, and three alternatives were identified to answer each paragraph, which are (always, sometimes, rarely), and the total score for the scale is (78) degrees.

- **Scale instruction numbers**

Instructions have been set for the students on how to answer the scale items by marking (√) in front of the paragraph and under the alternative that fits their opinions and not to leave any paragraph unanswered, specifying the time required to answer the scale.

### **sinceritythe scale**

It is one of the most important characteristics of educational standards or tests and one of the conditions that must be met in a toolsearch,It is one of the most importantproperties to judgeOn the validity of the test tool and its ability to measure the phenomenon to be studied (Al-Jubouri, 2018: 169). **Authenticity has been verifiedIn two ways:**

- l- **Virtual validity:** been displayedMeasure of attitude towards mathematicsOn a group of arbitrators, to give each of them his opinion in paragraphsThe scale and in order to verify the validity of the scale items, to measure students' attitude towards mathematicsAnd how well it was formulated and how appropriate it is to define the goal for which it was set, and to propose appropriate amendments,A rate of (80%) or more was taken as an agreement on the validity of the paragraphsAllen, 1979)) indicates that this method is one of the basic methods in reaching apparent validity, which is sufficient to justify the use of some measures (Allen and Yen, 1979, 119).

### **b- The validity of the construction**

The researcher verified the validityConstruction of the scale of attitude towards mathematicsThe way to find the internal consistency of the test items by degreeesthe students Whose They were testedThe second survey, which will be discussed later.

- **applicationscale on the sampleThe first reconnaissance**

To determine the answer time and to know the clarity of the paragraphsthe scaleDonethe scaleOn an initial survey sample from the research community and not from the research sample consisting of (30) student They were chosen at randomfromOsama Bin Zaid Middle School,It was the average time to answer the test (40 minutes) The results of the application resulted in a lack of inquirieshe studentsIn the course of responding to paragraphsthe scale,This shows the clarity of paragraphs and instructionsthe scaleand relevancefor all students.

- **Applying the scale to the second survey sample**

The scale was applied to a second survey sample consisting of (100) students of the first intermediate gradeaRandomly from the Brothers Intermediate School for Boys on Thursday corresponding to 4/5/2023 for the purpose of identifying the characteristics of the scale, statistical analysis of its paragraphs, and detection of weak paragraphs that need to be replaced if they are invalid, according to the following steps:

#### **a. Construction sincerity**

It is defined as the degree to which the test measures a characteristic or characteristic that it was originally designed to measure. (Al-Dulaimi and Adnan: 2005, 125)

In order to verify the validity of the construction, the relationship was found between the answer to each paragraph of the scale and the total score of the scale, and its value ranged between (0.300-

0.623) and that the value of the tabular correlation coefficient at the level of significance (0.05) with a degree of freedom (61) is equal to (0.276), and this means that it is Statistically significant, and this confirms the goal of building an attitude scale towards mathematics

### **Seventh: Procedures for applying the experiment**

In order to preserve the integrity of the experimental design, and to reach accurate results and to answer the research questions, the following steps and procedures were adopted:

- 1) Before starting to teach ilapThe control and experimental groups, the researcher conducted an equivalence betweenMy search group whereThe intelligence test was applied on (Sunday) corresponding to) 26/2/2023)
- 2) The experimental and control groups were taught the same scientific subject, and the two groups were given the same amount of assignments, educational activities, and classroom exercises.
- 3) The researcher made sure to teach DrlapThe two groups search both in the specified mannershe has,The experimental group studied according tointeractive learning technologies,The control group was studied according to the methodusual,The researcher taught my group Search by itself and according to the tableweekly,As the two groups studied inweek daysIndeedFive servingsper week for each group.
- 4) was not allowed tofor studentsswitching between the two groupsthe experimental and the controlduring the trial period.
- 5) The actual teaching of the two research groups began with regard to the experiment(Sunday) date)5/3/2023).
- 6) I applied atest theAcademic achievement on (thetwo)(8/5/2023).
- 7) The attitude scale towards mathematics was applied on Thursday, corresponding to(2/3/2023)

**Eighth: Statistical means:** In this research, the researcher applied the statistical methods manually and confirmed themusingStatistical bag program for social sciences -SPSSFor the extractionfollowing:

1. a test(t-test) for two independent samplesnotare equal:To calculate the equivalence between the control group and the experimental group in the variables of chronological age and previous achievement in a subjectmathematics and intelligence test,prior knowledgeAnd also to test research hypotheses.
2. Discrimination equation for the subject items: to calculate the differentiation coefficients for the achievement test items for a subjectmathematics.
3. Difficulty formula for the subject items: to find the difficulty coefficients for the achievement test items.
4. Equating the effectiveness of wrong alternatives for the objective items of the achievement test.
5. Eta square coefficient: to find out the effect size of the proposed strategy according to the interactive learning techniques in the achievement test and the measure of attitude towards the subject.

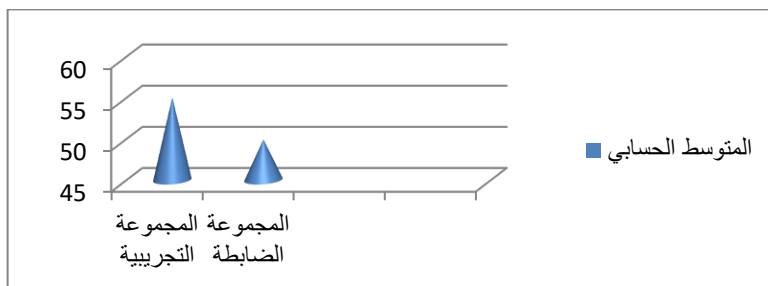
### **The search intent is validated by validating:**

**null hypothesis**thatyou stateon me:no There isy diffAndStatistical significance at the level (0.05) among the mean scoresstudentexperimental groupWhoseLessonwaAccording to strategy Proposed according to interactive education techniques and average gradesthe studentsthe control groupWhoseLessonwaAccording to the usual method in the achievement test for a

subject mathematics. In order to verify the validity of the first zero hypothesis, the arithmetic mean and standard deviation of the scores of the students of the experimental and control groups were found. The researcher obtained it from the results of applying the achievement test in a subject mathematics. The scores are arranged in a table for the experimental and control groups, and show that middle experimental group scores  $H(55,061)$  with a standard deviation  $(3.783)$ , and in when middle group scores control  $(49,933)$  and standard deviation  $(6.175)$ . To find out the meaning of the difference Use the t-test (t-test) for two independent samples are equivalent unequal, It turns out that values The T calculated  $(4,014)$ , It is greater than the tabular value  $(2)$  at the level of significance  $(0,05)$  and degrees of freedom  $(61)$ , This means that there is a difference  $y_j$  Statistical significance between the mean scores of the two groups in an Achievement test. Favor student experimental Group, Thus t Reject the null hypothesis and accept the alternative hypothesis Which states that there is a statistically significant difference at the significance level  $(0.05)$  in favor of the experimental group, that is, the use of strategy Suggested according to the interactive learning techniques had a positive effect in the achievement test as shown in the table (3), and form (1).

**Schedule(3) t value for two independent samples And Calculated, tabulated, arithmetic mean, and standard deviation of scores students The two groups Of Achievement test**

The meaning of the difference	Significance level	T value		degrees of freedom	standard deviation	SMA	the number	the group
		Tabularity	calculated					
function statistical experimental group	0.05	2	4,014	61	3.783	55,061	33	Experimental
					6.175	49,933	30	control



the shape (1) The arithmetic mean of the two research groups in the test post achievement

To make sure that this the difference was the effect of (strategy Proposed according to interactive education techniques) In (collecting) and the result of coincidence did not occur, The effect size was calculated by  $(\eta^2)$  eta-square, then finding  $(D)$  to detect the degree of influence, It is the value of the squared eta  $(0.208)$  It indicates a significant effect (strategy Proposed according to interactive education techniques) in achieving according to the standards established by Cohen, so Julie Blunt points out the values that Cohen ranked to explain the size of the effect (Julie Ballant, 2007: 246), The

degree of impact has reached ( 2.183) It is a significant degree according to the criteria set by him (kies, 1989: 445).As indicated in the table (4 ).

Schedule (4) the amount of tathirafor my reference

big	Medium	small	Tools
0.14	0.06	0.01	$\eta^2$
0.80	0.50	0.20	D

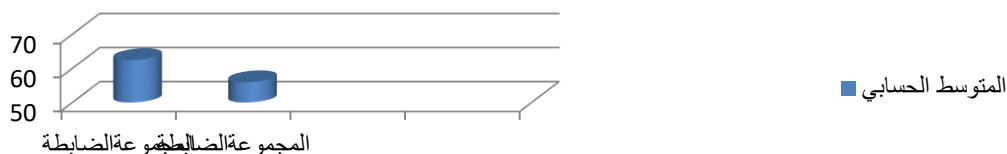
- The results of the second null hypothesis, which states:

no difference found And Statistical significance at the level (0.05) among the mean scores student experimental group whose lesson was according to strategy proposed according to interactive learning techniques and average grades student the control group who studied in the usual manner Measure of attitude towards sports.

In order to verify the validity of the second zero hypothesis, the arithmetic mean and standard deviation of the scores of the students of the experimental and control groups were found. The researcher obtained it from the results of an application Measure of attitude towards mathematics, where the scores are arranged in a table for the experimental and control groups, Appendix (14), and show that middle experimental group scores H(62,424) with a standard deviation (7,254), in when middle group scores control (55,933) and standard deviation (7,258), and to know the significance of the difference was done Use the t-test (t-test) for two equal, independent samples not equal, It turns out that values reflexology calculated (3.546), It is greater than the tabular value adult (2) at a level of significance (0,05) and a degree of freedom (61), This means that there is a difference yj Statistical significance between the mean scores of the two groups Measure of attitude towards mathematics Favor student experimental Group, Thus t Reject the null hypothesis and accept the alternative hypothesis Which states that there is a statistically significant difference At the significance level (0.05) in favor of the experimental group, that is, the use of strategy proposed according to interactive learning techniques It had a positive effect on Measure of attitude towards mathematics as in table (12), and form (2)

Schedule (12) the value for two independent samples Calculated, tabulated, arithmetic mean, and standard deviation of scores student The two groups in Measure of attitude towards mathematics

The meaning of the difference	Significance level	T value		degrees of freedom	standard deviation	SMA	the number	the group
		Tabular	calculated					





					7,258	55,933	30	control
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the shape (2) the arithmetic mean of the two research groups in Measure of attitude towards mathematics

To ensure that these differences were the result of an effect (use strategy Proposed according to interactive learning techniques) in (Measure of attitude towards mathematics) It did not happen by chance, The effect size was calculated by (2 $\eta$ ) Square eta, then finding (D) to detect the degree of influence, as the value of the ETA square ( 0.171) It indicates a significant effect ( strategy Proposed according to interactive learning techniques) in Measure of attitude towards mathematics According to the criteria set by Cohen, Julie Planet indicated the values that Cohen classified to explain the size of the effect (Julie Planet, 2007: 246), while the degree of influence reached ( 2.651) Which is a great score According to afor the standards he set (kies, 1989: 445), as in the table (11).

Second: interpretation of the results:

-Interpretation of the results of the first null hypothesis: This results signals a search to Outperform the experimental group who They studied by strategy Proposed according to interactive learning techniques on the control group who studied in the usual way in a variable (Achievement) The reason for this superiority of the experimental group from the researcher's point of view is due to several reasons, the most important of which are:

1. that teaching According to the strategy Proposed in accordance with the interactive learning techniques provided opportunity for students using experiences and educational skills And different exploratory to get through it to information and concepts is intended Learn it with credit on themselves In finding and constructing meaning because These interactive learning techniques cFocus on the necessity of action wato Practice to increase understanding and build information and then Increase performance in achievement test.
2. spirit enhancement initiative to reach To solve the problem through classroom and positive activities in dialogue and debate, This is what generates momentum as scientific inside the line, This is what emerged from the educational attainment for students.
3. That's a strategy Proposed according to interactive learning techniques helped students on the order of knowledge and set goals Observing understanding and evaluating results They arrived afor hima Bthe Self-efforts by reflection and re-establishment Building, any use Interactive learning techniques make it MRealizen The importance of learning and doing a Miscellaneous active and

apply each what he was learned in new events that increase his understanding of information that was studied.

4. that interactive learning technologies made it possible for students to play a role through the education process. It contributes to building the meaning that leads to the development of his communication skills in a positive way, through dialogue, discussion, and the exchange of opinions and ideas, and this leads to positive learning.

that teaching according to interactive learning technologies enabled the opportunity to produce multiple assignments to the problem, and by relying on a variety of sources and that's what increases understanding of data and moves away from memorization and narration for scientific material. This leads to an increase in the level of knowledge of students and then performance improvement by attainment and increase the trend towards mathematics.

Third: Conclusions: in light of the search results, the researcher reaches the following:

1- Teaching according to interactive learning techniques contributes to improving the degree of acquisition of skills and information among first-grade intermediate students in academic achievement.

2- Teaching according to interactive learning techniques contributes to improving the attitude of first grade students towards mathematics.

Fourthly: Recommendations: in light of the research results, the researcher recommends the following:

1. The use of interactive education technology in teaching mathematics in the preparatory stage because of its positive impact.
2. Training male and female teachers to deal fruitfully with the potential of interactive education technology in various aspects.
3. statement School teachers Mathematics for class for the first average from study plans and test attainment and the measure of direction towards matter.

Fifth: Proposals: In order to complete the research, the researcher proposes a procedure follows:-

1. Impact of technologies for interactive education in acquiring concepts of athleticism and intelligence social I have fourth-grade students.
2. Effect Technologies for interactive education in the collection of the subject revival and logical thinking I have fourth grade science lab.

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