The Effectiveness of Educational Pillars Based on Vygotsky's Theory in Achievement and Information Processing Among First Intermediate Class Students

https://doi.org/10.3991/ijet.v16i12.23181

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Abstract—The aim of the research is to identify the effectiveness of the educational pillars strategy based on Vygotsky's theory in mathematical achievement and information processing of first-grade intermediate students. In pursuit of the research objectives, the experimental method was used, and the quasi-experimental design was used for two equivalent groups, one control group taught traditionally and the other experimental taught according to the educational pillars strategy. The research sample consisted of (66) female students from the first intermediate grade, who were intentionally chosen after ensuring their equivalence, taking into account several factors, most notably chronological age and their level of mathematics, and they were distributed equally into two groups, one experimental and the other control. The research tools were represented in the teacher's handbook for the application of the educational pillars strategy, the achievement test in mathematics, and the test of information processing skills. The researchers applied the experiment in the first semester of the (2019/2020) academic year. One of the researchers taught the experimental group by applying the educational pillars strategy, while the control group studied according to the usual method. The mathematical achievement test and the data processing skill test were applied to the experimental and control research groups, and then the data necessary for statistical analysis and access to results were obtained. The results showed that there were statistically significant differences between the mean scores of the two groups and control groups in the mathematical achievement test. There were also statistically significant differences between the mean scores of the two groups on the test of the skill of information processing, and the size of the effect was calculated by describing a function of the effectiveness of the strategy on the two independent variables (mathematics achievement, information processing), as it became clear that the educational pillars strategy based on Vygotsky's theory has great effectiveness. On mathematics achievement and on developing students' information processing skills.

Keywords—Educational pillars, Vygotsky's theory, Academic achievement, Information processing

1 Introduction

Teaching mathematics has received the attention of educators; teaching experts in recent times, and what is called success in learning mathematics has taken several changes as one of the types of response to changes in education and society as a whole[1, 2]. Whereas, the two researchers were diagnosed through their work as teachers at the University of Baghdad, the College of Education for Pure Sciences - Ibn Al-Haytham, and during their frequent visits to schools, in addition to exchanging views with the teachers of the subject (the third researcher), and the applicants and briefing them on the grades records, the textbook vocabulary, and discussions with the teachers And those who confirmed that they find it difficult to teach the new curriculum, as mathematics teachers try to complete the new curriculum using the regular method, which leads students to save information without understanding it, which will negatively affect their achievement, and the usual teaching methods in schools are one of the reasons for students 'poor achievement and the difficulty of addressing The information they have, due to the difficulty of transferring scientific knowledge through it to students and the lack of interaction and communication between students and teachers. Hence, the current research problem arises, as previous studies and educational reality prove the low levels of information processing among middle school students, especially the first grade, which was observed by one of the researchers from the reality of his work as he noticed that most students do not realize the importance of mathematics and its life value. As students of that stage suffer a lot from many difficulties in studying mathematics, especially engineering lessons, which resulted in their low academic achievement and weak interest in learning it, which led them to become alienated from it, among its teachers; As a result of the feeling of a partial absence of pleasure, and the real benefit that accrues to them in learning mathematics[3-5]. Many studies also indicated the decline in students 'mathematical achievement, as they emphasized the students' need to develop their academic achievement about the need to change the actual teaching methods used in classes within the mathematics curriculum, and given the weakness of students 'information processing and mathematical achievement skills, they must be developed among the learners. To achieve this goal, appropriate methods and methods must be followed. Where [6, 7] emphasizes that one of the main factors of low mathematical achievement among students is the teachers 'adoption of traditional teaching methods and strategies, and then educators have called for the need to apply modern learning strategies, especially those that derive their foundations from constructive learning, where constructive learning views the learning process as a process. Effective and active centered around the learner who practices activities by himself identifies the problem, searches for solutions to it, collects information, and tests those solutions [8-10]. One of the teaching strategies appropriate for this purpose, which is based on the social constructivist theory, is the "educational pillars strategy", as this strategy is characterized by training the learner in sound thinking, and investing what he owns in terms of means and tools. To contemplate situations, confront tasks and reach the necessary comprehension and understanding, gain the necessary experience to learn independently, and depend on himself later in learning and life[11-13] . The researchers found that despite the importance of this strategy and its effectiveness in teaching mathematics at the global and Arab level, there is a lack of awareness of that strategy

that appears among the subject teachers that researchers touched through their daily work, and then studying this strategy and investigating its effects on achievement and information processing is one of the most prominent Current search problems.

2 Limitations, Importance, and Assumptions of Research

The research is determined by his work in governmental middle and high school daytime schools in Baghdad governorate, the center. And female students of the first intermediate grade at Al-Istiqlal High School for Girls in the General Directorate of Baghdad Education, Rusafa 1, Baghdad Governorate during the first semester of the academic year (2019-2020). And the study of information processing skills includes three sub-skills (summarizing, identifying mathematical relationships and patterns, evaluation). The theoretical importance of the research, as the research provides a literary review of the educational pillars, which is a strategy based on Vygotsky's social constructivism theory, and thus contributes to enriching the educational literature, as this strategy has not been adequately addressed in the educational sphere, especially in the field of mathematics. It is the first research of its kind (as far as researchers know) that examines the effect of the educational pillars strategy as an independent variable on two dependent variables, namely, mathematical attainment and information processing, which are two important variables for mathematics. It encourages the application of modern strategies by reviewing that strategy and the mechanism for its implementation. As for its practical importance, it is derived from the fact that it is field research that applies effective and modern strategies. It contributes to attracting the attention of curriculum designers, educators, and teachers to modern strategies for teaching mathematics, especially that the chosen strategy is characterized by the interaction between students and between students and the teacher, which is something we need a lot in mathematics classes. The research tools such as a test to measure the mathematical achievement of middle school students and the information processing test may be used to measure these variables as part of future educational research. The research provides a booklet for the teacher with lessons designed according to the educational pillars strategy, which is a guide for teachers to help them design more lessons in mathematics in the light of that strategy and the principles of Vygotsky's constructivism theory. Finally, the research presents plans and activities for teaching mathematics according to the educational pillars strategy that may help mathematics teachers in teaching some theories, principles, and concepts of mathematics. The research seeks to verify the hypotheses, the first one is " "there are no statistically significant differences at a significance level (0.05) between the mean scores of the experimental group that were studied by applying the educational pillars strategy and the control group that was studied in the usual way in the mathematical achievement test of intermediate first-grade students." Also, "there are no statistically significant differences at a significance level (0.05) between the mean scores of the experimental group that were studied by applying the educational pillars strategy and the control group that was studied in the usual way in examining the information processing skill of the first intermediate grade students".

2.1 Most important search terms

1. Effectiveness: It is the power or influence of something in achieving the goals for which it was prepared to achieve expected results and reach them as far as possible. Or the amount of the effect of an independent variable on a dependent variable that is affected by it and is called the dependent variable that occurs as a result of experimental treatment or application of the independent variable and its experiment [14]. In our research, efficacy is defined as "the power of the influence of the educational pillars strategy on the independent variables represented in mathematical achievement and information processing, which results in the development of both of them."
2. Educational pillars: It is a strategy that involves assisting the learner by his teacher or his more experienced peers to enable this learner to cross the gap between his level before assistance to a higher level after assistance, which is required to be reached through the learning process. It describes various methods of learning employed in learning activities that reflect Real situations. It is a teaching strategy that the teacher uses temporarily, as it provides the student with a set of activities and tasks that raise the level of understanding of the student as much as he needs for the student to obtain specific skills and abilities that enable him to continue learning individually[15-18]. It is defined in the current research as "a teaching strategy based on Vygotsky's social constructivism theory and a region of near-mind development in which the learner is in a situation in which he needs to provide supports and learning aids represented in activities, questions, or others that make him an individual capable of carrying out the same activities alone if he is faced with similar ones." Later."
3. Achievement: It is a procedure organized according to specific standards aimed at knowing what the learners have reached and acquired from facts, concepts, and skills after studying a study subject regardless of the number of its pages, it may be after the completion of a unit, chapter or course. As for mathematical achievement, in particular, it is the amount of mathematical information and mathematical skills that the learner acquires in addition to what he learned in terms of thinking methods and the ability to solve mathematical problems as a result of studying a curriculum, which results in his ability to solve problems and reach to achieve the objectives of the mathematical courses that this learner studied, and it is considered The achievement test in mathematics is a test that measures the amount of what has been previously acquired by the learner[19]. Researchers define mathematical achievement as “the amount of knowledge acquired by the student in terms of knowledge, skills and abilities that make him familiar with mathematical laws, mathematical and engineering foundations, and other things that are included in the course, and then he becomes able to apply the curriculum in a way that achieves the general and specific goals of mathematics. Decision ". And procedurally defining it as the level of female students of the first intermediate grade in mathematics through the score they obtain in the achievement test that will be prepared by researchers.
4. Information processing: It is the individual's distinctive method, the level of its reception, the treatment of the learned material and how it is circulated, distinguished, transformed, and stored for it, and how much and how it uses, derives, or

produces connections from among the new and existing information in the cognitive construction. It is also a cognitive process that takes place in the mental field to expand perception, through organization, classification, coding, analysis, evaluation, and criticism of information to represent it, assimilate it, retain it, and retrieve it, and it extends between the surface and depth, and the expansion of information according to the nature of the goal of learning[20-22]. The researchers adopted a definition [23] as a theoretical definition of the research. As for the procedural definition, it is the ability of the first intermediate grade female students to (summarize, identify mathematical relationships and patterns, evaluation) and it is measured by the total score that the students of the research sample obtain when they answer the information processing test that will be prepared by researchers.

3 Theoretical Background and Previous Studies

3.1 Educational pillars

The educational foundations of the strategy: The educational pillars strategy came as an application of one of the most important learning theories, which is the constructivist theory, and it provides immediate assistance to the learner that enables him to continue to form his knowledge and it helps him to form the same knowledge again without his help or support[24, 25].The name of the educational pillars, or as some researchers call it, the educational scaffolding is a reflection of support for learning or the provision of support to the student by his teacher and in the process of providing support or dismissal, the teacher helps the student to complete a task that the student cannot perform alone[26]. The roots of the strategy go back to Lev Vygotsky, the early founder of social constructivism who believed in social interaction and as an integral part of learning. One of the basic theories is the theory of the zone of proximal development and the basis of the educational pillars. Where the learner arrives according to the theory to a point where the learner needs external assistance, as this part of the student's growth controls how he learns. ZPD has been described as the area in which learning occurs when helping the student to learn a concept in the classroom, and then in the scope of helping students with learning, many educators and theorists have proven Vygotsky's works and theories, and that student learning often occurs in the area mentioned by Vygotsky, namely The very moment the student needs the educational supports[27, 28]. According to Vygotsky, the region here means "development," as it indicates a continuity in changing behavior or the degree of its progress from the lowest to the highest, that is, it is not a point but is related to behaviors that develop shortly, which is what Vygotsky sees occurs at two levels that represent the boundaries of that region, which is the distance that the individual reaches with the help External. The educational pillars are one of the learning systems that emphasize the dynamism, movement, and interaction of students in the educational-learning process, as they allow the employment of activities and learning resources according to the abilities and readiness of students and their potential, in addition to their previous knowledge, and the purpose of the educational pillars is to meet the needs of learners and enhance their motivation, and from Then their experience increases and their abilities and skills increase [29].The educational pillars are a series

of a system that includes educational content, activities, and tasks under the assistance of the teacher or peers to improve learning and increase knowledge. It is the process of strengthening students as they independently apply new skills. It is a set of teaching steps and procedures that the teacher follows to build meaningful learning, and it depends on the organized planning of several educational situations, within which the teacher employs auxiliary activities such as hints, discussions, and cooperative work and the aid is in the form of temporary educational pillars subject to change or modification, aiming to help students to complete the tasks assigned to them and to cross the gap between what the student already possesses of knowledge and what he seeks to know, as well as helping him to participate in different skills that increase with the time, which makes him able to deal with different situations then achieve the desired goals and thus turn into a self-learning learner independently in the future [30, 31]. Types of educational pillars The application of the educational pillars strategy needs supports or scaffolding or aids provided to the student and there are several types of these pillars, for example; Conceptual pillars which is a type of pillar that helps students solve more complex problems or demystify a concept such as concept maps and the content tree[32].Procedural Pillars are a type of pillar that helps students to conduct specific skills and tasks accurately and flexibly[33, 28]. Strategic Pillars, is a type of pillar that allows the student to choose or define alternatives within the methods and learning techniques in line with his learning style and also trains the student to choose the most appropriate strategies for solving problems[34, 35].Adaptive (inferential) pillars: a flexible type of pillar that can adapt to students' needs and helps in making a continuous diagnosis to push students towards logical thinking and finding explanations and proofs while writing the solution [36]. Metacognitive pillars, These pillars help in developing thinking skills and learning processes such as self-regulation and observation . The educational pillars strategy has several characteristics. It is based on social interaction, realizing in-depth thinking, and takes place in an atmosphere of participation and support, avoids frustration, and adopts raising the motivation of learners towards learning, and includes clear directions, disclosure of learning objectives, the continuation of the process Learning, verification of mission accomplishment, and prediction in light of asking questions centered on the subject of the lesson. The fact that the educational pillars are considered as aids provided within a strategy that proceeds according to organized steps that begin to assist when the student reaches the area of proximal or imminent growth or when he arrives to bring previous knowledge about a topic, but he cannot link it with modern knowledge without assistance, means that facilitate the implementation of the strategy and usually, there are such Aids or props are in two forms:

1. Auxiliaries: It revolves around the role of the teacher as he provides it in the form of supports or aids to the student. Examples include hints for reflection and verbal cues, hints to help the student self-organize information, think aloud, models, use of computers, etc.
2. Implicit strategies: Here we mean employing some strategies when applying pillar strategy steps such as modeling, questioning, feedback, cooperative learning, peer education, problem-solving, and others[37].

Steps to implement the educational pillars strategy:

1. Preparation: The teacher provides a general idea of the topic of the lesson, using tips and motivating questions, and engages students in thinking about the elements of the lesson.
2. Teamwork: The teacher participates with students in part of the ideas of the lesson, then asks them about it and gives them a way to answer questions freely. He can also encourage students to work in small groups.
3. Individual learning: In this step, the teacher allows each student to learn individually, that is, independently, and he supervises this process and exchanges dialogue with the students.
4. Feedback: The teacher gives feedback (help to students at this stage), corrects their mistakes, and then asks them to employ the feedback on their own.
5. Hold the learner accountable: The teacher holds the student responsible for all the learning process and stops assisting him and periodically reviews the student's performance until learning is mastered, and after the student takes responsibility, he becomes more independent and is left to learn individually without the teacher's intervention with the introduction to a new educational practice that the student can perform alone.
6. Giving the student the opportunity for independent practice: The teacher provides his students with new learning situations, whereby each student performs the learning process independently to broaden and deepen the understanding of the lesson [30].

3.2 Academic achievement

Academic achievement is one of the topics that have sparked controversy among researchers since the beginning of the last century, and the disagreement focused on the most influencing factors in academic achievement, some of them attributed it to individual factors related to an individual's intelligence and abilities, which from their viewpoint are inherited factors, and some of them responded to environmental factors. With its disparate elements. And some see academic achievement as a result of the interaction of genetic and environmental factors. Academic achievement aims primarily to obtain information that shows the extent to which students acquire the experiences they have learned in the prescribed academic subjects, as well as the extent to which students acquire the contents of these subjects. It also aims to obtain quantitative and qualitative information about the student's academic level, and it may aim beyond This is an attempt to paint a psychological picture of the student concerning his performance [38, 39]. The importance of academic achievement is usually attributed to the post-measurement stage, which is the rationalization of student learning. The teacher, based on his knowledge of his students 'achievement level, directs them to additional readings and experiences, classroom or home activities, or even encourages them to continue towards the better. And transfer students from one stage of study to another, which is usually done in the final achievement test. Amending and revising educational curricula and aids, improving school facilities and methods of interaction with students, and the models for their organization and management of learning and achievement as dictated by their achievement results. And providing the

student with a tool that shows the level of his scientific progress, motivates him to further progress and directs him to request more attention [40]. From the researchers' point of view, academic achievement in mathematics is of great importance, as the student needs to acquire a large number of symbols, representations, rules, mathematical theories, and so on, which mathematics carries in its folds, and therefore the pursuit of raising the level of achievement among students becomes an urgent matter for all mathematics teachers.

3.3 Information processing

Interest in the theory of information processing began in the forties of the last century when psychologists tried to understand the mechanisms of cognitive processes (coding, storing, and retrieval), and the information processing approach was associated with the development of computer systems. It is considered a cognitive trend that seeks to study cognitive phenomena, by tracing the steps and stages through which information is processed according to a processing system characterized by (sequencing, organization, and integration). It simulates information processing systems in a computer[41]. Cognitive psychologists have assumed that information processing takes place through a series of successive stages so that each stage leads to the next, so we find that the information-processing approach is interested in researching and clarifying the steps that the learner adopts in collecting, organizing, and remembering information, assuming that they are searching From knowledge, and extract from it what they deem appropriate. The owners of this trend view the learner as a researcher and an active information processor, as he is aware of environmental events, transmits and hears information, merges it with his previous knowledge, and organizes it to be meaningful [42]; And that information processing is based on basic assumptions, which are:

1. Information processing takes place in stages that mediate the reception of stimuli and produce the appropriate response. The form of information and how it is represented mentally differs according to the stages of processing it undergoes.
2. Human cognitive processes are metaphorically similar to the processors that take place in a computer. The functions performed by the human system are similar to the functions of a computer, as it receives information, stores it in the memory, and retrieves it when needed.
3. Information processing affects all cognitive activities: perception, repetition, thinking, problem-solving, remembering, forgetfulness, and imagination.
4. The direction of information processing can explain all the cognitive activities performed by the human being, by searching for the intermediate pr cesses, which preceded the cognitive response in all its different fields.

Basic concepts in the information processing approach There are four basic concepts of information processing: First: Storage, which means acquiring information, through storing information New in memory. Second: Coding means changing the image of the new information from one form to another, because the information that is stored in the memory is not stored in the way it is given to us, but rather it changes from one form to another. Third: Retrieval, which is the process of remembering in-

formation that was previously stored in memory. Fourth: Processing, which is the chain of actions or changes, including the information that shapes human thinking and that occurs between receiving, storing, and retrieving the stimulus. The most important skills of Information processing are summarizing which is a process that requires an accurate understanding of the text and its reduction without disturbing the main ideas; Identifying mathematical relationships and patterns which means the ability to perceive links and link between lower mathematical concepts to create higher mathematical concepts; Evaluation i.e.It is setting specific criteria for decision-making and issuing judgments in addition to the skill of recognizing errors or detecting inaccuracies.

4 Research Methodology and Procedures

The research relied on the semi-experimental method that uses two groups, one of them is control and the other is experimental. The research took the experimental design as shown in Table (1). As for the research community, it may be one of the first intermediate grade students in Baghdad Governorate, the First Rusafa Education Directorate. The research sample was chosen intentionally and it was divided into two groups: the control group, which studied traditionally, numbering (33) students, and the experimental group, which studied using the educational foundations, and its number (33) students as well. To implement the procedures for controlling parity of the research sample, the two research groups were rewarded with several variables (previous knowledge, chronological age, previous achievement in mathematics, information processing skill test). These variables were determined by obtaining information on chronological age and previous achievement in mathematics from records. As for the previous knowledge, the students 'grades were obtained after testing them, checking their answers, and determining the grades of each of them. When a comparison is made between the mean scores of the experimental and control research groups using the t-test for two independent samples, it was found that the calculated value (t) is less than the tabular value. In the three variables, which means that the two research groups are equivalent to the mentioned variables.

Table 1. Experimental Design for Research

Groups	Previous application	Experience	Post application
Experimental group	Pre-application for the mathematical achievement test,the test of information processing	Teaching by using educational props	The dimensional application of the mathematical achievement test, the information
Control group		Teaching by the traditional way	

To prepare the research requirements, the researchers chose two semesters (polynomials and open sentences) scheduled in the mathematics curriculum for the first intermediate grade for the year 2019/2020. The teacher's booklet was prepared, as the researchers prepared it as a guide in teaching the proposed unit using the educational pillars strategy. The booklet aims to explain how the mathematics teacher uses the educational pillars strategy in developing students' mathematical achievement and

information processing. The guide was prepared by researchers reviewing the literature and studies related to the educational pillars strategy, especially in teaching mathematics, and the guide includes the introduction, the goal, the philosophy on which the evidence is based, the definition of the principles of applying the educational pillars strategy, the distribution of shares according to the unit's topics, the general objectives of the unit In light of the social constructivist theory, the instructions for the steps involved in teaching topics by following the educational pillars strategy. The brochure or guide was presented to a group of expert referees and specialists in methods and approaches to teaching mathematics to verify the suitability and correctness of the objectives, the suitability of the steps of the teaching process for the principles of social constructivism theory, and the strategy of educational pillars, in particular, the appropriateness of the exercises and tasks with the course and with the age group and academic year of students, the extent of validity Choose suitable orthotics. In light of the opinions of the referees, the teacher's booklet was amended, and then the final picture of the evidence applied in the current research was reached. Then, the research application tools were prepared, namely, the Academic Achievement Test in Mathematics and the Information Processing Test, as follows: Academic Achievement Test in Mathematics: Prepared to measure the extent to which students achieve mathematical concepts in the third and fourth semesters (polynomials and open sentences) in the first part of mathematics textbooks for the first intermediate grade, in light of the review of what is relevant to the research topic from a previous study, especially that which The tests were included as a tool for it, and the same test was used to verify the equivalence of the experimental and control research groups before applying the experiment, and the same test was applied laterally to measure students 'achievement after applying the experiment. The first intermediate grade in the third and fourth semesters (polynomials and open sentences) in the first part of the mathematics textbook for the first intermediate grade, by referring to the course textbook and the teacher's guide, and extracting the most prominent mathematical concepts and principles, by which the general and specific objectives of the course are achieved, the behavioral goals have been determined For the test, as it was determined according to Bloom's classification to (knowledge, comprehension, application, analysis, synthesis). Table of specifications and determination of relative weights based on the number of objectives specified in the course. And developing a list of mathematical principles, theories, and concepts that students study in mathematics in the selected semesters. The test questions are formulated to include what has been learned. And taking into account the suitability of the wording for the age group of the female students, as the test included some necessary instructions that the students will follow to apply the test, such as the test time and the method of answering. The test questions varied to cover Bloom's classification as previously mentioned, and the test may consist of (30) items giving the correct answer one score. The apparent authenticity of it has been ascertained, which is meant by the appearance of the test that it measures what it was designed for, that is, it refers to the general appearance of the test or its external image in terms of the suitability, wording and clarity of the paragraphs [43]. In order to achieve this purpose, the test was presented in its initial form to some arbitrators specialized in measurement and evaluation, and methods of

teaching mathematics and the test obtained more than 80% of agreement between the opinions of the arbitrators and whoever modified the items of the test in its final form according to their opinions. And to ensure the validity of the content, and it is intended that the test items reflect what has been studied in the part selected for the test in it[44], Also the fact that the preparation of the achievement test items was carried out according to the specifications identical to the Bloom classification as previously described within the preparation, and as these specifications are considered one of the indications of the validity of the content, which also indicates the number of paragraphs besides the objectives to be covered through those paragraphs[45]. The test is honestly content and can be applied to the exploratory sample. For an exploratory experiment for the achievement test: The test was applied in its initial form to many first-grade intermediate students consisting of (35) students from the same school in which the experiment was applied to other than the research sample. The experiment aimed to determine the appropriate time for the test and this was done by calculating the average The arithmetic of the time of the students 'answers until the last student finished answering, and it became clear that the appropriate time for the answer is" 45 "minutes. Hence, the Cronbach alpha equation was used to calculate the test reliability, and the value of the reliability coefficient was acceptable. The third and fourth semesters (polynomials and open sentences) were taught in the first part of the mathematics textbook for the first intermediate grade of the mathematics course for the two research groups during the first semester of the year 2019-2020 AD. Where the students of the experimental group studied according to the teacher's guide that was prepared according to the educational pillars strategy, and the control group students were studied in the usual way. And applying the achievement and data processing tests, after teaching the two groups of researchers, and then processing the data statistically.

4.1 Research results

1. The validity of the first hypothesis test: "There are no statistically significant differences at the level of significance (0.05) between the mean scores of the experimental group that were studied by applying the educational pillars strategy and the control group that was studied in the usual way in the mathematical achievement test of intermediate first-grade students." To verify its validity, the post-mathematical achievement test was applied to the students of the experimental and control groups, and the arithmetic averages, standard deviations, and values of the (T) test were calculated to identify the significance of the differences between the two groups in the mathematical achievement test. Table (2) shows that, and by looking at it and the statistical data it includes, it becomes clear that there are statistically significant differences at the level of significance (0.05) between the mean scores of the experimental group that were studied according to the educational pillars and the control that was studied in the traditional method in the post-test of mathematical achievement for the benefit of the experimental group. Where the calculated value of T was greater than the tabular T value, which means rejection of the hypothesis. This indicates an increase in mathematics achievement among

the experimental group members for whom the educational pillars strategy was applied. The results also indicate the effectiveness of teaching according to the strategy on the achievement of the students and to know the value of the effectiveness of the strategy, as the formula for the size of the directed effect complementing the statistical significance was applied, taking into account the values of the (t) test and the degree of freedom. The size of the effect is very large in the results of Table (3). This value indicates the effectiveness of the strategy or its positive impact on mathematical achievement among first-grade intermediate students from the experimental research sample.

Table 2. The arithmetic means, standard deviations, and (T) test values for the two research groups in the dimensional mathematical achievement test

Groups	No.	Mean	S.D.	t-test value tabular	t-test value calculated	Dgree of freedom	Signi. level	St. sig.
Experimental	33	39	7.1	1.97	3.99	64	0.05	significant
Control	33	31	5.99					

Table 3. The magnitude of the effect (effectiveness) of the pillars strategy on mathematical achievement

Independent Variable	Dependent Variable	D.Value	η 2	Effect Size
Teaching is according to the Educational pillars Strategy	Mathematical Achievement	1.093	0.186	Very Big

2. The second hypothesis test: "There is no statistically significant difference at the level of (0.05) between the average scores of the experimental group students who studied with the educational pillars strategy and the control group who studied in the usual way in the information processing test"; through the use of the Shiffe test, it was found that the value of Shiffe computed between the experimental group and the control group is equal to (9.39), which is greater than the critical value (6.203), as shown in Table (4). From the observation of the presented result, we note that there is a statistically significant difference at the level of (0.05) between the mean scores of the students of the two experimental groups and the control in the information processing test, thus rejecting the second null hypothesis. This result is attributed to the fact that the educational pillars strategy enables the students to have the skills of analytical accuracy of a single problem, thus increasing the student's analytical skill, and this skill was positively reflected on the skills of mathematical information processing.

Table 4. Schiffe tabular and the significance of computed values

Comparisons	Scheiffe's Computed Value	The Critical Schiffe Value	Statistical Significance at the level of 0.05	Results
Experiment group	9.39*	6.203	Statistical function	There were significant differences in favor of experimental
Control group				

4.2 Explanation of the results of search

1. Results related to the first dependent variable, which is a mathematical achievement: The results related to this variable presented in Table (4) showed that the experimental group that studied by applying the educational pillars strategy has outperformed its control counterpart that studied in the usual way concerning the first dependent variable represented in achievement in a subject Mathematics, which indicates the effectiveness of the strategy in raising the level of mathematical achievement, and the researcher attributes that to the following reasons:
   - The educational pillars strategy raises the learners 'ability to learn and increases their interaction with educational situations and evokes their previous knowledge easily in light of the provision of assistance in the context of the topic of the lesson that the learner needs, whether it is by his peers or his teacher. And what he aims to learn during the learning process, based on Vygotsky's theory (ZPD), which increases his acquisition of mathematical information and concepts.
   - The educational pillars make the student face the educational situation in a way that mimics the reality, discovering the strengths and weaknesses and what he needs in terms of help and support from others, which makes him get a set of information that he usually stores in memory for a longer period.
   - Steps to implement the strategy, especially the group learning step, help students reduce the confusion and frustration they may feel and thus be able to pass the situation and achieve the learning objectives individually in the next step, "individual learning", which results in increasing their cognitive achievement.
   - Teaching bridges the educational pillars strategy of the gap between the teacher and the student and that is due to the principle of educational pillars which is the provision of assistance by the teacher, or from any available source to achieve the educational goal.
   - Teaching using the educational pillars strategy leads to continuous and effective communication between the learner and his teacher on the one hand, and the learner and his peers on the other hand, which reflects positively on educational attainment.
   - Through the implementation of the steps of this strategy, the teacher can identify the various needs of students and transfer his knowledge and skills expertise to them.

- Teaching, using the educational pillars, contributes to providing immediate feedback to students, which leads to an immediate correction of the learning path.
- The educational pillars strategy helps students develop their ability to retrieve the information they studied before that while providing the necessary gradual assistance to them during the learning process, which leads to easier access to new knowledge, its organization in memory, then retrieval and application later.
- The educational pillars give the student an opportunity for continuous interaction and increase his skills such as description, clarification, and interpretation of mathematical relationships, symbols, etc. and make the possibility of his understanding of the material easier, and then increase his acquisition of information and increase his achievement.

2. Results related to the second dependent variable, which is information processing: The results related to this variable showed the superiority of the experimental group that was studied according to the educational pillars strategy over the control group that studied in the usual way with regard to the second dependent variable represented in processing information, which indicates the effectiveness of the strategy at a high The level of information processing and the researchers attribute this to the following reasons:
   - The educational foundations helped students to collect information, organize it, follow it up, and make a summary of the content without disturbing the main ideas.
   - The educational pillars allowed students to represent their mathematical knowledge and various problems through pillars such as conceptual and mental maps, which lead them to realize links and links between lower mathematical concepts to create higher mathematical concepts.
   - The educational pillars (conceptual maps such as concept maps, hints, exclusion of unnecessary data, etc.) helped in setting certain criteria for decision-making and making judgments, in addition to the skill of recognizing errors or detecting inaccuracies.

5 Conclusion

1. The educational pillars strategy based on Vygotsky's theory has a clear effectiveness in raising the level of achievement in mathematics.
2. The strategy spreads a new spirit for the mathematics class, during which the endemic fears within students about the difficulty of that subject will be eliminated and the aversion to it will be reduced.
3. The educational pillars strategy has great effectiveness in developing information processing skills.
4. Using the educational pillars strategy contributes to students 'awareness of the value of mathematics and its relevance to reality and daily life applications.

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Article submitted 2021-04-08. Resubmitted 2021-05-17. Final acceptance 2021-05-18. Final version published as submitted by the authors.