

The Effect of the Four Pillars Strategy on the Achievement of Middle-Grade Students with Biology and the Ability to Decision Making

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Abstract--- *The research aims to: Identify: (The effect of the four pillars strategy on the achievement of middle-grade second-year students with biology and the ability to Decision Making). To verify the research goal, the following two hypotheses were formulated: There is no statistically significant difference at the level of significance (0.05) between the average achievement levels of students studying according to the four pillars strategy and the average score of students studying according to the usual method. There is no statistically significant difference at the level of significance (0.05) between the average decision-making degrees for students who study according to the four pillars strategy and the average degrees of students who study according to the usual method. The research sample consisted of (86) students with (43) students for the experimental group and (43) students for the control group from the second year middle school students in science high school for boys, and the two groups were rewarded with variables (academic achievement, previous information, intelligence, and decision-making), and identified the article Of scientific studies in the seven chapters of biology subject, 2nd edition of 2018, teaching plans have been prepared for the two research groups, and the behavioral purposes of the scientific subject classes, which numbered (167), have been behavioral purpose according to the six levels of Bloom's classification respectively (remembering, assimilation, application, analysis, composition, Calendar), and a sister was prepared A summary consisting of (40) objective items of the multiple choice type, a decision-making scale has been prepared that consists of (80) items formulated on (20) problems, and after completing the teaching of the scientific subject for the two research groups applied the two tests (achievement and decision making) after If the psychometric properties of the two variables were confirmed, then: The experimental group outperformed the control and decision-making group over a statistically significant difference.*

Keywords--- *Four Pillars Strategy, Achievement & Ability to Decision Making.*

I. RESEARCH PROBLEM

Despite the many methods of teaching and modern strategies that have proven effective in teaching through the results of research and studies, the educational character in teaching now is dominated by the traditional method that relies on the preservation and retrieval of information, which leads to a low level of achievement because the learner is burdened with information from one stage to another without Any change in the teaching method, as biology contains many scientific facts and information and concepts important for learners in the intermediate stage, so we need teaching strategies in which the learner is a positive and effective element in the learning process Mieh participate effectively and the freedom to express his opinion and to listen to the views of others in order to raise the

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level of collected and the development of his talents and his ability to improve decision-making when faced with educational and social problems.

The researchers distributed a questionnaire to a number of biology teachers, who number (8) within the first Rusafa Education Directorate to seek their views on the teaching methods used and the level of students' achievement in biology through an open questionnaire. The answers were as follows:

1. 90% Answered that there was a decrease in the level of learners' achievement in biology because of the use of the regular method.
2. Answered that the learners do not have the ability to Decision Making 90% in most situations
3. All of them replied that they had no information about the Four Pillars strategy and through, so the problem can be identified by the following question:

What is the effect of the four pillars strategy on the achievement of middle school students with biology and the ability to Decision Making?

II. THE IMPORTANCE OF RESEARCH

The Holy Qur'an was concerned with science in general, which is the basis of the educational process and education and the related education with great interest. The first verse was revealed. It read in the name of your Lord, who created Surat Al-Alaq verse (1) and it says in the hadith "The request of knowledge is obligatory for every Muslim and Muslim woman" And based on the noble Qur'anic verse and the many honorable hadiths that talked about science, this science contributed to the emergence of education and teaching, and thus the educational process that worked hard to build the society's paper and build the human personality so that it is distinguished from other creatures by what God gave of reason and knowledge.

Educators emphasize in the curricula, especially the science curriculum, that the educational process is no longer only the transfer of knowledge to the learner, but rather a process based on learning the learner how to learn and how to think and use scientific mental habits in implementing learning and processing activities in a scientific way and facilitate the process of applying information and transferring it to the positions associated with it and limiting its function in Life of the twenty-first century according to transformations and personal and social need (Zeton, 2007: 119).

The implementation of strategies depends on the principle of the learner's success and efficacy in education, as well as relying on themselves to monitor their learning, and this makes his necessity to apply the strategies in a professional and efficient way so that he gives the desired results in it (Abu Rayash, 2008: 15).

An example of these strategies is the strategy of the four pillars, which works to encourage students to move, enthusiasm and activity through the movement of students and dialogue among them, and is used with learners in groups, and it also encourages listening and oral dialogue where learners communicate with this dialogue to think and the ability to make the right decision, It also gives an educational environment rich in fun and fun so that learners compete to collect and verify information and then present the correct answer and evaluate it (Ryder, 1998: 178).

The ability to Decision Making is linked to solving problems so that researchers and educators see it as an essential pillar that must be given great attention in the educational process (Mahmoud, 2006: 114).

Salovic explained that decision-making is the main pillar of the desired goal and that he was taught in the past by philosophers, but his history in psychology is short. The theory of decision-making was touched upon for the first time in the journal Reports to the world Edwards (Al-Baaj, 2015: 11).

Several studies examined the effect of teaching strategies on achievement and the ability to Decision Making. The Zamili study (2018) examined the effectiveness of teaching with the strategy of the four pillars in the achievement and logical thinking of science for second-grade middle school students and the results showed the superiority of the experimental group who studied using the four pillars strategy over the control group.

As for an urgent study (2014), it targeted the effectiveness of teaching with TRis theory in the achievement of second-graders middle school students in physics and their ability to Decision Making and concluded that the experimental group outperformed the control group in the achievement test and decision-making test.

Al-Khuza'i study (2016) showed that the experimental group outperformed the control group in the achievement test and the decision-making scale of the fifth scientific students.

The researchers believe that there is an urgent need to make the science curricula contain many positions to develop their ability to solve problems, since if the science curricula are designed on the basis of placing students in front of problems they face and they have to solve them, then the learner will find himself in urgent need to develop appropriate solutions to these problems and thus lay the foundations for setting Right decisions where the learner is able to make the appropriate decision and the teaching of science becomes interesting and fun, especially in teaching biology, which contains many topics that make the learner in front of problems through which he can take the appropriate decision even outside the walls of the school. From the above, the importance of the research can be summarized in the following points:

1. It presents the Four Pillars strategy as one of the teaching strategies that helps the teacher achieve achievement in biology.
2. It draws the attention of planners and implementers of curricula (biology) to the necessity of integrating the strategy of the four pillars in the content of biology in order to achieve effective learning.
3. It hopes to add a new source of knowledge that strengthens libraries, as well as give indicators on modern strategies for teaching in general and the four pillars strategy and their impact on achievement and decision-making in particular.

The Research Goal

The research aims to: Identify:

(The effect of the four pillars strategy on the achievement of middle-grade second-year students with biology and the ability to Decision Making). To verify the research goal, the following two hypotheses were formulated:

1. There is no statistically significant difference at the level of significance. (0.05) between the average achievement levels of students studying according to the four pillars strategy and the average score of students studying according to the usual method.
2. There is no statistically significant difference at the level of significance (0.05) between the average decision-making degrees for students who study according to the four pillars strategy and the average degrees of students who study according to the usual method.

Research Limits: Intermediate second-grade students in secondary and middle schools affiliated to the first Rusafa District, Al-Husayniyah District (Center). The first semester of the academic year 2019-2020.

Defining Terms

The Four Pillars Strategy

Defined by: (Hopkins, 2003): "It is a strategy in which teaching can be applied through verbal communication, listening and participation so that knowledge and facts can reach the learner in the best way" (Hopkins, 2003: 90).

(Badawi, 2010): "It is a strategy based on a principle in which learners are required to make a correct decision to solve a problem or answer a question that has been asked so that appropriate opportunities are provided for learners to discuss this problem and think about its solution." (Badawi, 2010: 465).

Theoretical definition: A strategy based on a principle that prevails in mental thinking among learners, which leads to motivating and stimulating learners towards the academic topic and getting them used to thinking and discussing, which provides opportunities for a rush towards learning and cooperation between the teacher and the learner to increase achievement and their ability to Decision Making.

Procedural definition: A method by which a decision is requested to make a decision on a topic or a question that has been posed so that the possible answers are placed in each of the four corners of the class and learners wander to the corner that explains their thinking on the best solution to solve the question, after discussion and thinking to solve the question so that each group represents a learner Head to the corner believed to be correct.

Achievement

Defined by: (Oxford, 1998): "The output gained in order to achieve an achievement or learn something successfully and skillfully" (Oxford, 1998: 10).

(Al-Lokani and Ali, 1999): "The extent of students' understanding and understanding of what has been obtained of certain knowledge and skills during educational curricula and is measured to the degree that students obtain in achievement tests" (Al-Lokani and Ali, 1999: 58).

The two researchers adopt the definition of Al-Lakani and Ali in 1999, theoretically.

Procedural definition of achievement: It is the degree obtained by the student when he responds to the items of the achievement test prepared for the purposes of the current research.

Decision Making Ability

Defined by: (Holt, 1993): As "a process that identifies a problem, gives solutions, and selects and applies one

solution" (Holt, 1993: 131)."

(Nofal, 2010): As "a mental process for selecting a better alternative, this process can depend on the skill of the one making the decision" (Nofal, 2010: 119).

(Abdel Aziz, 2013): "It is a mental process that aims to select the ideal solution for the individual towards a specific situation that can be linked to a work or marriage in order to achieve the goal" (Abdel Aziz, 150: 2013).

Theoretical definition: A mental process related to logical thinking that requires attention and reflection based on thinking and awareness to define the problem and analyze its aspects in order to choose the ideal alternative to solve it.

Procedural definition: The degrees obtained by students after taking the test and their response to the items of the decision-making scale prepared for the current research.

Theoretical Background

The Four Pillars Strategy

The idea of this strategy is based on the teacher asking a question that contains four alternatives, and these alternatives contain a perception of the alternative for the learner, and the teacher puts the four alternatives in the corners of the class in order for the learner to stand at the answer that he thinks is correct, and the goal of this strategy is to broadcast an atmosphere of pleasure and activity or Vitality in the classroom, in addition to knowing the concept of alternatives among learners (Ambo Saeidy, 2016: 469). (

Steps of the Four Pillars Strategy

1. Preparation: It includes: dividing the learners into four groups, and each group represented by the learner. Supplying four labels. - Labeling the four corners of the row.
2. The problem: It includes: Presenting the problem or question to the learners.
3. Implementation: It includes: Giving learners 2 minutes to think about solving the question. The teacher allows the representative of each group, who deputizes for his colleagues, to move to one corner of the class that he believes contains the correct answer. The teacher discusses with the representative of each group that answers the question.
4. Evaluation: It includes: The teacher clarifies the correct answer and praises the owner of the correct answer. The learner's interpretation of his correct answer. Teacher praise the learner's correct answer (Richard: 2005: 89).

Achievement

Achievement is one of the terms of general psychology and it means the individual achieving the goals he set. As for educational psychology, it means proficiency in the school side and is generally or refers to a specific skill, where achievement is one of the important topics that must be taken care of (Ahmad, 2012: 5).

Academic achievement is considered the primary aspect or pillar in the educational process because of its importance in achieving educational and educational goals, which it is hoped to reflect positively on the learner and

the educational process, and it is also an important concept in measuring the learner's mental performance and has a great importance in evaluating performance, especially performance Associated with mental activity and is a basic criterion from which to know the academic level of the learner (Al-Khalidi, 2008: 89). (

The Ability to Make a Decision

Decision-making is the heart of the administrative and educational process and the primary focus of all its fields. Also, since the decision affects the elements of the administrative process of planning and organization, which is part of solving problems, and that decision-making is based on the close relationship with daily life (Atwi, 2014: 136).

Janet indicates that the individual must become able to take a decision when attending and that the individual has prior experience and know-how in order to be able to solve the problems facing him in life situations, because this experience and know-how are considered a basis in solving problems and for the individual to make wise decisions To provide the scientific method in thinking and thus to take a decision (Al-Otaibi, 2008: 2).

III. RESEARCH METHODOLOGY AND PROCEDURES

Experimental design: To verify the research hypotheses, the design of the randomized, non-randomized control group was adopted (Al-Zobaie & Al-Ghanam, 1981: 128). Table (1):

Table 1: Experimental Design Approved in the Research

Group	the independent variable	Valence	the dependent variable
Experimental	Intelligence, Previous Information, Decision Making	The Four Pillars Achievement Strategy	Achievement, decision Making
Control		usual method	

Research community: The research community includes students of the second average middle school students who number (671) male students in Al-Husayniyah district of the Education Directorate north of Baghdad, the first Rusafa.

The research sample: It was intentionally selected from the Secondary School for Science for Boys, and it consisted of (86) students distributed equally among two (A and B) divisions by (43) students for each division, and by randomly selecting, the (A) division became experimental, & (B) control unit.

Equivalence of the two research groups: Parity was achieved in the following variables:

Previous Achievement

In biology for the first intermediate grade

The first (final) degrees of the two research groups in biology for the first intermediate grade for the academic year (2018-2019) were obtained from the official school administration record.

After applying the T-test for two independent samples, it was found that the calculated T-value (0.539) is less than the tabular T-value (1.980) at the level of significance (0.05) and the degree of freedom (84), which indicates that there are no differences between the degrees of the members of the experimental and control groups in previous

academic achievement variable Table (2).

Table 2: The Experimental & Control Groups in the Previous Academic Achievement Variable

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	70.790	10.742	0.539	1.980	84	0.05	not statistically significant
Control	43	69.441	12.421					

Previous Information

A bio-information test was prepared from (25) substantive items of the multiple choice type, and to confirm and was presented to a group of arbitrators in the methods of teaching science, education and measurement. Their number was (10) arbitrators and each item reached an agreement percentage (80). %) The two arbitrators included an acceptable item according to Cooper's equation of the agreement, and the model answer was prepared to test the previous information.

After applying the test and correcting the answers, the mean of the experimental group scores was (16.697), a standard deviation of (2.858) and the mean of the controlling group scores (16.325). And a standard deviation of (2.696) and using the T-test equation for two independent samples of equal number showed that there is no statistically significant difference between the students of the two groups in this variable, Table (3):

Table 3: T Value of the Experimental and Control Groups in the Previous Information Variable

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	16.697	2.858	0.621	1.980	84	0.05	not statistically significant
Control	43	16.325	2.696					

Intelligence

(Raven) test was adopted for successive matrices, the mean of the experimental group scores (37.767) and the standard deviation (5.545) and the mean of the controlling group scores (36.651) and the standard deviation (5.584) and using the t-test equation for two equal independent samples The number shows that there is no statistically significant difference between students of the two groups in the IQ variable Table (4).

Table 4: The Calculated and Tabulated T Value for Students of the Two Research Groups in the IQ Variable

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	43.767	5.545	0.930	1.980	84	0.05	not statistically significant
Control	43	36.651	5.584					

The Decision-Making Test

To students of the two research groups, the average score for the experimental group was (46,000) and a standard deviation (5.135), while the average score for the control group (44.666) and a standard deviation (5.728) and using the T-test for two samples Two independent women of equal number, showing that there is no statistically significant difference between the students of the two research groups, Table (5).

Table 5: Decision-Making Variable

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	46	5.135	0.876	1.980	84	0.05	not statistically significant
Control	43	44.666	5.728					

Requirements for Conducting the Experiment

Course Identification: Classes were defined before the experiment, which includes the content of the course that will be taught to students of the two research groups during the experiment for the seven semesters of the biology book for the second intermediate grade, 2nd edition, for the year 2018AD for the academic year (2019-2020), table (6).

Formulation of Behavioral Goals

The behavioral goals were formulated based on the content of the study material, and their number reached (167) behavioral goals according to Bloom's classification of knowledge at its six levels (remembering, comprehending, application, analysis, composition, evaluation).

Number of Teaching Plans

(20) teaching plans were prepared with (10) experimental levels according to the strategy of the four pillars and (10) adjusted according to the usual method.

Its suitability is representative and appropriate to the steps involved in each of the two research groups.

Search tools:

1. Achievement Test: The test was prepared according to the following step:

A. Determining the Objective of the Test: The test aims to measure the achievement of the average second graders' achievement in the seven semesters.

B. Scientific Subject Determination: The scientific subject was determined by the seven chapters in the science book, Biology Part, for the second intermediate grade, scheduled for the 2nd year of the year 2018 for the academic year (2019-2020).

C. Defining Educational Outcomes: The educational outcomes were determined by the ability of students to (remember, assimilate, apply, analyze, synthesize, evaluate) and the number of test items was limited to (40) test items based on expert opinions.

The numbers of the test map (specifications table): A test map has been prepared for the content of the seven chapters of the science textbook Biology for the second intermediate grade and for the six levels of the cognitive field, Table (6).

D. The Selection of Behavioral Purposes: According to the test map: (40) behavioral goals were selected from the group of behavioral goals of (167) behavioral goals based on the test items in the specifications table represented by the six behavioral goals.

Table 6: Test Map for Achievement Test Items

Chapter	Subjects	Number of pages	Content weight	Relative importance	Remember 27%	Comprehension 34%	Apply 17%	Analysis 10%	Synthesis 8%	Evaluation 1%	Total
fifth	classification science	11	13%	12%	1	2	1	zero	zero	zero	4
Six	How to classify organisms	12	11%	14%	2	2	1	1	zero	zero	6
Seventh	Simple Living Organisms	12	20%	14%	2	2	1	1	zero	zero	6
Eight	Kingdom of Plants	14	18%	16%	2	2	1	1	1	zero	7
Ninth	Animal Kingdom	16	20%	18%	2	2	1	1	1	zero	7
Tenth	Environment and its components	12	11%	14%	2	2	1	1	zero	zero	6
Eleven	Ecosystem balance	11	7%	12%	1	2	1	zero	zero	zero	4
Total		88	100%	100%	12	14	7	5	2	zero	40

E. Building the Achievement Test Items: The objective test items (multiple choice) were prepared with (40) items where a test item was formulated for each behavioral purpose commensurate with its level of knowledge according to what is found in the test map and for each item four alternatives were established, one of which represents the correct answer and three wrong.

G. Correcting the Achievement Test: The test items were corrected by giving one degree for the correct answer and zero for the wrong answer. Thus, the total score for the test ranged from (zero - 40) degrees.

H. Effective of the Items: The achievement test was presented to a group of experts in the methods of teaching science, education, measurement and evaluation, and all items obtained a percentage of agreement (80%) according to Cooper's equation of the agreement and thus the apparent sincerity of the test has **been achieved**.

I. Application of the Test: To the exploratory sample: The test was applied to a first exploratory sample consisting of (42) students from the second intermediate class in the Al-Ghazali Intermediate School of the Directorate of Education, north of Baghdad, which is affiliated to the Directorate of Education in Baghdad, the first Rusafa.

IV. VALIDITY CONSTRUCTION INDICATORS

A. Item Discrimination: The test was applied to a sample consisting of (120) students from the second

intermediate class of students from the Baghdad Directorate of Education in the first Rusafa. Students' answers to represent the higher group, and the lowest (27%) of the students' answers to represent the lower group by (32) answers for each group. After applying the distinction equation, it was found that it ranges between (0,34 - 0,56). On this basis, the item discrimination factor is appropriate.

B. Difficulty Coefficient: The number of correct answers for each item was calculated, the difficulty equation was applied and it was found that the coefficient of difficulty for the test items ranged between (0.38 – 0.69), and the item is acceptable, when compared with the standard that was determined by Bloom (0.20 - (0.80), we find that the passages are acceptable (Bloom et al. 1983: 107).

C. The Effectiveness of the Alternatives: After applying the formula for the effectiveness of the alternatives, it appeared that the alternatives had attracted a greater number of students in the lower group compared to the students of the higher group, and thus decided to keep the wrong alternatives as they are.

D. Ratability t of the Achievement Test: To verify the internal consistency of the achievement test, the Kuder-Richardson 20 formula was used for a random sample of (80) students from the statistical analysis sample. (0.70 – 0.90) in the general balance of correlation coefficients indicators (Abu Lebda, 2008: 223)

The final version of the achievement test: The test, in its final form, 12 consisted of (40) objective items.

2. Decision-Making Scale

The scale items are formulated in the form of (problems) present in the life and social field that students face and requires students to take an appropriate decision to confront these problems and there are four decisions for each position, all of them are correct and there is one decision that is closest and most acceptable to the situation and is given (4) score for the student who chooses the decision The optimum and (3) score for the student who chooses the least accepted decision from the optimal decision and (2) the degree for the student who chooses the less acceptable decision than the decision before him and one degree for the student who chooses the decision less than the decision before him. The number of items of the total scale reached (80) item formulated on (20) problems, which consisted of: For the total score for the test (80).

Validity of the Scale: Apparent honesty: The scale was presented to a group of experts in the methods of teaching science, Appendix (14) to judge the validity of the positions. The researcher obtained an agreement rate (80%), which means that most experts agree on the validity of the scale.

Applying the Scale to the Exploratory Sample: The scale was applied to a survey sample consisting of (42) students for the second intermediate class from the schools of the Directorate of Education, north of Baghdad, the Baghdad Directorate of Education, the first Rusafa. It was found that all items of the scale are clear and understandable, and the average response time was (35) minutes.

The Discriminatory Strength: Of decision-making items: Each item was analyzed using the t-test for two independent samples. The calculated T-value was considered an indicator for distinguishing each item after its budget with the tabular T-value (2) at the level of significance (0.05) with a degree of freedom (62), It turns out that all calculated T values for all items are greater than the tabular value.

Reability of the Scale: The Alpha Cronbach Formula was applied to (100) questionnaires randomly pulled from the statistical analysis sample, where the value of the Alpha Cronbach to the scale (0.84) and the correlation coefficients with this amount are an acceptable indicator of the stability of the scale, as (El-Essawy, 1985) indicates The correlation coefficient should range from (0.70 – 0.90) if the instrument is to be described as having an acceptable stability (El-Issawi, 1985: 58).

The Scale in its Final Form: The scale in its final form consists of (80) items formulated on (20) problems for each problem, four alternatives, the student must choose the alternative that he finds appropriate to solve the problem.

V. PRESENTING AND DISCUSSING THE RESULTS

The first hypothesis: (There is no statistically significant difference at the level of significance (0.05) between the average levels of achievement of students who study according to the four pillars strategy and the average of the degrees of students studying according to the usual method) And to verify the hypothesis, the T-test was used for two independent samples, and it was found The calculated T value (7.395) is greater than the tabular T value (1.980), which indicates that there are differences between the experimental and control groups in favor of the experimental, that is, the superiority of the experimental group students who studied the four pillars strategy over the control group students who studied in the usual way Table (7).

Table 7: T Value of the Difference between the Experimental and Control Groups in the Post Achievement Test

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	31.372	3.964	7.395	1.980	84	0.05	statistically significant
Control	43	23.441	5.807					

This result is consistent with what is stated in the theoretical background, which indicated that the use of the four pillars strategy in teaching contributes to raising the level of academic achievement.

This result is consistent with the results of the Zamili 2018 study, which indicated the effectiveness of the four pillars strategy in raising the level of academic achievement among students.

The researchers believe that this result is logical when adhering to the strategic steps of preparing and presenting problems, implementation and evaluation, which gives learners an opportunity to listen, discuss and think, thus improving their achievement level.

Impact size: To calculate the magnitude of the effect of the four-pillar strategy on achievement using the Eta square (2) and its value was (0.39), and to determine the level of the effect size, there is a specific level proposal in the size of the agency effect: 0.01 small, 0.06 medium, 0.14 Large (Nassar, 2006: 54). Thus, the magnitude of the impact will be significant for the strategy of the four pillars in achievement.

The second hypothesis: (There is no statistically significant difference at the level of significance (0.05) between the average decision-making scores for students studying according to the four pillars strategy and the average scores of students studying according to the usual method), and to verify the hypothesis, the T-test was used For two

independent samples to know the significance of the difference between the arithmetic mean and the standard deviation for the members of the experimental and control groups, and it was found that the calculated T value (4.951) is greater than the tabular T value (1.980), which indicates that there are differences between the experimental and control groups in favor of the experimental group in taking Resolution, Table (8).

Table 8: T Value of the Difference between the Experimental and Control Groups in Decision Making

Group	Sample	mean	standard deviation	T value		freedom degree	significance level	significance of differences
Experimental	43	47.186	4.861	4.951	1.980	84	0.05	statistically significant
Control	43	41.860	5.111					

This result is consistent with what was stated in the theoretical background, which indicated that the use of the four pillars strategy in teaching contributes to the interaction of learners with other points of view, which leads to raising their level of ability to Decision Making when facing problems.

This result is consistent with the results of the studies of Al-Zamil 2018, Urgent 2014, Al-Khuzai 2016, Al-Karawi 2017, which indicated the effectiveness of strategies in raising the skill of decision-making ability of learners.

The researchers believe that this result reflects the direct relationship between academic achievement and the ability to Decision Making. When the level of achievement rose, the level of ability to make a decision increased.

Impact size: The value of the ETA squared for the decision-making variable (0.22). When comparing this value with the specific proposal, we find that the effect of the four-pillar strategy was significant on decision-making.

VI. CONCLUSIONS

1. The implementation of the lesson according to the good preparation, presentation of problems, implementation, and evaluation leads to raising the level of achievement for students.
2. Teaching with the Four Pillars strategy does not only raise the level of achievement, but rather contributes to increasing the decision-making ability of learners.

RECOMMENDATIONS

- Holding training courses for teachers on the use of the four pillars strategy in teaching.
- The necessity of including the strategy of the four pillars in the curricula in colleges of education.

SUGGESTIONS

The researchers suggest conducting the following two studies

- The effect of the four pillars strategy on academic achievement in chemistry.
- The impact of the four pillars strategy on developing productive thinking among students.

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