Effect of Cooperative Learning Strategy on Cognitive Activity of Students in Physics for Third Intermediate Grade Within schools of Basra Education

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ABSTRACT

Physics is not in isolation from this development that the world is witnessing in development of teaching methods, as it is among the scientific subjects that are concerned with developing students' cognitive and mental capabilities and seeks to raise its level, so researchers have taken care of this subject and worked to embody this development by setting advanced concepts and research up level of education in the schools of Iraq and the Arab countries. The study aimed to know the effect of cooperative learning strategy in physics in the development of cognitive activity among students of the Third Mediterranean within the schools of Basra. Researcher adopted the semi - experimental curriculum to determine the impact of the independent variable on the dependent variable, relying on that experimental design with the two groups: the number of the research sample (32) students was divided into two volumes of an experimental group (16) students and a control group (16) students. Where they were chosen in a simple random manner from (Ahl al –Bayt) Intermediate school in Basra Governorate, the morning government education for the third intermediate grade, and students were distributed in the control and experimental groups and distribution also within the same group, taking into account the differences in the characteristics of students, and the following study tools were applied to them: the illustrated intelligence test To check equal groups. Creative Thinking Test (Torrance) in its verbal form, and the statistical processing of data was done using: the average arithmetic, standard deviation, "T" test of two interconnected or two independent eyes, homogeneous and the most important of the condemnation:

1-There are statistical differences in the grades of the experimental group students between tribal and post measurement.

2-There are statistical differences between the grades of the control and experimental group in the post measurement.

Keywords: Cooperative Learning Strategy; Cognitive Activity; Physics.

1-1Introduction Research and importance:

Humanitarian thinking is one of the topics presented to be discussed by philosophers and thinkers, ancient and modern, as it has become one of the most subjective subjects, the many of the complex manifestations surrounding it, and human thinking has several types and different classifications, and creative thinking is one of these types, which is a mental activity characterized by research and launch Freely in multiple directions, which distinguishes every activity

characterized by creativity and seriousness. Therefore, education has become a question about its role in preparing a student who possesses not only thinking but skill thinking, as the aim of education requires good quality in education through a comprehensive development of educational science and finding approaches that fulfill the purpose, which requires preparing a sufficient teacher capable of helping Learners to choose the most appropriate strategies that they can use during the learning process, where they learn the way they suit their thinking, this would increase or develop their ability to acquire different thinking skills and reach alternative and unfamiliar solutions on the educational methods facing them in the acres that You need an analysis, interpretation, or conclusion, and thus develop their thinking sense. Our current era is the era of creativity and knowledge explosion, which requires the preparation of an educated person for the present and the future, and this will only take place through the good use of the learner for information and creativity in its use. Therefore, education scholars realized the importance of teaching methods, including cooperative learning, because of its joint work that achieves fruitful success, so the methods and methods of teaching changed towards teamwork and urged students to interact and participate in the framework of collective cooperation required by contemporary life. Therefore, this study focused on the impact of the cooperative learning strategy in teaching physics on the cognitive activity of the third average students.

1-2Research problem:

Through the educational process in teaching physics for more than 25 years in the schools of the Basra Education Directorate for intermediate and middle school, the researcher noticed the lack of new and effective teaching methods to raise the level of students and their entitle Lack of diversification in the presentation of the study positions, the most important of which is the subject of physics, whose teachers suffer from complete reluctance by the learners because of the problematic positions, experiments, conclusions, which make the learner alienated from the memorization of skill supreme thinking to answer the professor's directives and analyze results for a specific experimental design, and among the most prominent Strategic teaching strategies that help the professor stir up levels of thinking among students are the cooperative learning strategy, which gives them the opportunity to exchange the largest amount of ideas and gain cooperative skills by working in the spirit of one team, this helps to develop that may think of thinking and cognitive activity and the development of their mental cod.

1-3 Research Aims:

1- Learn the impact from the application of cooperative learning strategy in the field of teaching physics in an extensive way to increase and acquire cooperative skills by students and develop cognitive activity among students.

2- Students 'entire physics by applying the cooperative learning strategy and the development of their cognitive abilities in a way that helps them to succeed and excel

1-4 Research Hypotheses:

1- There is a moral effect between the tribal measurement of the students 'tests and the remote measurement of the group that used teaching the cooperative education strategy.

1-5 Research fields:

1-5-1 Human field: Intermediate students of (Ahl Al -Bayt) school for the third grade year for the academic year 2022/2023.

1-5-2 spatial field: Ahl Al -Bayt School for Boys within the Basra Education Directorate

1-5-3 Time field: from 20/10/2022 to 20/3/2023.

1-6 Terms:

Cooperative learning: a strategy of learning strategies in which the professor divides the students into small groups, and each of them includes 4 to 6 students represented by a leader, so that the group is comprehensive for various achievement levels. To achieve the desired common goal. (Dawood Abdel Malik: 1996)

2- Theoretical studies

2-1 Definition of cooperative learning strategy:

Cooperative learning strategy revolves around the student, where he learns within small groups and contributes to teaching the rest of his colleagues, in order to achieve a common goal and is an educational goal. (Khaled Al -Ghamdi: 2008**).**

2-1-1- Definition of cooperative learning:

(Khaled Al -Ghamdi: 2008) defines it as a form of symbolic learning in which the interaction between the group members is required in all its cooperative forms.

It is defined by (Dhabia Al -Sulaiti & Saeed Faraj: 2011) is a teaching strategy by dividing students into small groups from 4 to 6 homogeneous students that include all different achievement levels.

2-2- Definition of physics:

Physics: A branch of science, concerned with studying the physical (material) world energy and material and how it is linked, as physicists study the nature of the movement of electrons and rocks, energy in sound waves, in electrical circuits, and the installation of the material starting from the electron to the universe. According to the definitions of systematic books

- Physics is also a quantitative science whose goal is to describe all phenomena in the natural world in terms of a few basic relationships between the properties of measuring and energy material. These basic relationships are called the laws of physics.

3 - Research methodology and field circles

3-1- The curriculum of study:

The nature of the study problem is the one that threatens the type of approach that the researcher follows in his holding from a different group of scientific curricula.

The curriculum also means a set of rules that have been established in order to reach the truth in science, and the curriculum is defined as "the way that the researcher follows in study to the problem to discover. The truth is, "And since the phenomena were a different and reluctant mandarin, the curricula used in their Eastern differed, and each curriculum has its function and characteristics that each researcher uses in his field of competence. (Sami Melhem: 2002) The researcher used the two -group experimental design, one of which is experimental studying physics using a colonial learning strategy and the other is an officer studying the same physics subject in the traditional way used in schools.

3-2 Study and Sample Community:

study community is determined at the middle school students for the third intermediate grade, and 32 students were chosen in the random way, and after that the research sample was divided into two controlled and experimental groups by (16) students for each group, and the variables of the study were controlled, as the alien changes must be controlled by the experiment. "It may be affected by many among the external factors and majesties of the implementation of the experiment, so the researcher must control and embody factors and prevent their impact on the worker in order to be able to achieve accurate and correct results. (Muhammad Al -Baghdadi: 2005).

3-3 Exploratory study:

The researcher in the application of illustrated intelligence test "Ahmed Zaki Saleh" with the aim of controlling the intelligence variable, which may bear its impact on the experiment, also to avoid the occurrence of students who obtained good results in physics in one group, whether the experimental group or the control group, then the researcher also set the collection variable In physics, the temporal variable has been seized for the two groups as well, as the wages were concluded for the exploitation of the following points:

- Learn about study field, its characteristics and features
- Estimating the potential difficulties in the basic study.
- Determine the appropriate tools for the study and the extent of the members of the sample.
- Learn about the sample members and contact them to achieve communication with them
- Determine the appropriate time for basic study.
- Control the potential variables on the dependent variable, namely:

3-4 Tests used in Research

-3-4 -1 Intelligence Test:

The photographer "Ahmed Zaki Saleh" test was applied by the researcher personally to the students of the two groups. It took about 25 minutes to explain and apply the test to the two groups with adherence to the conditions of the application stipulated in the ministerial curriculum, and the students 'grades in this test were calculated in both groups using a test (T) to calculate the significance of the differences and the following table, it shows:

Table (1)
Shows significance of the differences between the grades of two groups in photographer test

Groups	Number of student	Arithmetic median	Standard Devotion	T value	Freedom degree	sig
Control group	16	45.44	6.17	0.20	15	moral
Experimental Group	16	45.81	6.75			

We note through table (1) that value of (T) is not indicative, and this means that there are no differences between the two controlled and experimental groups in the grades of students on the illustrated intelligence test, which indicates the equal study group in the level of intelligence.

3-4-2 Test Description: test contains two currencies for education and a question brochure.

- Instruction booklets: It includes the definition of the test, its purpose, how to do it and correct it, accompanied by the correction key and drip in terms of honesty and steadfastness, then an explanation of the mental development lines and the stopping of this growth, then the practical value of the test, and this mentions some of the incuses that you dealt with.

Questions: It includes three sections:

The external page is dedicated to data related to the examiner, name and nickname, age and history of the fees

The first and second page is dedicated to the instructions and explanation attached to illustrative examples that the laboratory will solve for the purpose of training on them, then corrected by the examiner to ensure a good understanding of what the test requires.

3- 4- - 2 -1 Test Applications:

The video intelligence test "Ahmed Zaki Saleh" was applied to the sample collectively while providing the appropriate atmosphere for the department, and providing the necessary tools for each student (pencil, eraser, tanning ..) and the researcher each time reminds of time, while the test was applied in the morning period to preserve On the high focus of students, the researcher has followed all the instructions mentioned previously, including the correction method.

5-3 Paul Torrance creative Thinking Test:

Turning Test of Creative Thinking appeared in 1966, then in 1974 this test was launched in an educational environment represented in the disclosure of creative and development students that had been creative by providing them with appropriate educational conditions. (Gerd David & Josh Frederick: 2010)

Say scale description: Torrance tests consist of twelve tests, and these tests were distributed in three batteries: Torrance battery, Auditory, the verbal battery, Verbal which is the battery adopted by the researcher as a tool of data collection tools from a sample collection the study.

- The examiner gets a vehicle mark in the test (as a whole, i.e. one battery), which is the sum of its sub -signs on the sake of fluency, flexibility and originality that each test measures.

3 - 5 - 1 Verbal Batteries (Mahmoud Allam: 2003)

Verbal image is composed of Torrance test for creative thinking from six sub -test:

A. Ask questions: The examiner is required to generate as much questions as possible about an exciting image in the form of an image in order to determine the position expressed by the image.

B. The reasons are enlarged: in which the examiner is required to write all the reasons or introductions that explain the position reflected by the image.

C. The results are enlarged: The examiner is required to write everything that can result from the position represented by the previous image, whether it is the consequences or possible results in the near or distant future.

D... Production improvement: It revolves around the foolish that can be used to make improvements in a game of children's games, which can give more fun and fun to the child who plays with it.

And it is assumed that: The examiner is presented in this test, a picture that represents an imaginative territorial situation, and he is asked to write all the results or consequences he expects on the land that the position presented by the image is possible to happen. The verbal battery gives a total degree for each of the three factors that you address: fluency, flexibility and originality, and it takes about 49 minutes to be applied at a rate of seven minutes for each question.

3- 5 - 2 Instructions for applying Creative Thinking Test "verbal image:"

Torrance test who wants to apply this test, recommended necessity of adhering to following instructions before and during the test application:

1. Ensure that place designated for test is suitable in terms of capacity and temperature.
2. Ensure that tools needed for examiners during tests such as pens.
3. Use one of people who have confidence to help him apply the test.
4. Ensure that there is a timing watch to be able to give every time test for it.
5. Use a language suitable for level of examined students before and during the test.
6. Giving some simple directives that work to stimulate a kind of motivation in performance, such as saying before the application: O student, you will find in these tests and opportunity to think about fun and interesting things and you have to record ideas that you think had not thought about before.

3-6 Achievement Test in Physics

According to the rate of physics for the second semester of the year 2022/2023, the study sample was calculated by calculating the grades of students in both groups with the use of a test (T) to calculate the significance of differences between the degrees of students 'achievement, and the following table shows:

Table (2)

Shows the indication of differences between grades of two groups in the achievement of physics

Groups	Number of student	Arithmetic median	Standard Devotion	T value	Freedom degree	sig
Control group	16	9.91	3.63	0.20	15	moral
Experimental Group	16	9.55	4.73			

We note through table (2) that value of (T) is not indicative, and this means that there are no differences between the two controlled and experimental groups in obtaining the subject of physical and technological sciences, and this indicates the equivalence of the two Al -Aaras groups in collecting this article.

3-7 Old Time Change:

Age of the students represented by study sample was calculated by reviewing their school files, until we learned ages of the control group and ages of experimental group students, and then average students of students in both groups were calculated using the (T) test to indicate the differences between average ages of students, table next shows this:

Table (3)
Shows the significance of the differences between the average ages of two groups

Groups	Number of student	Arithmetic median	Standard Devotion	T value	Freedom degree	sig
Control group	16	15.50	1.03	0.15	15	moral
Experimental Group	16	15.56	1.26			

From table (3) that value of (T) is not indicative, and this means that there are no differences between the timeline of students in control and experimental groups, and this indicates equivalent of the two -age group in their ages. After controlling the three variables, the researcher confirmed the equal groups**.**

The cooperative learning strategy was applied in physics starting from 11/20/2022, where the time of the lesson was an hour and forty - five minutes by implementing a group of pre - studied educational units, and a set of points that helped the researcher and from

Record some notes on the course of the course of the study in physics.

- Identify the educational units that will be made for the basic sample.
- Dependence on the collective solution by the members of each group separately.
-Estimating the time that takes to solve each exercise or activity.
- Determine a plan to apply the basic desserts.

3- 8 Experimental Design of Study:

Study tool represented in the Creative Thinking Test of "Paul Torrance" was obtained. After that, the date for the application was determined in agreement with medium officials of the people of the house for boys that will be applied in the strategy of its students in physics and researcher began to apply the basic study, by teaching control group in way Regular and experimental group with cooperative learning strategy. The following stages included:

- First stage:

The researcher applied the tribal measurement "Creative Thinking Test" to the members of the two groups: the control group and the experimental group, by distributing the test forms to the study sam Then all the test forms were collected.

- Second phase:

The cooperative learning strategy was implemented and the first (15 minutes) of the class was allocated to explain the method of cooperative learning, the method of working in the physics subject, the principles on which it is based, and the rules that must be adhered to, and then teaching were done with exercises from each educational unit from the units

- The division of students into groups: Each group consists of (4) pupils. The smart students were distributed to the four groups, then the students are average intelligence, then the weak students, and thus the researcher achieved a characteristic of the approved strategy characteristics, which is the homogeneity of the cooperative group.

• Defining roles: The determination of the roles was limited to focusing on the role of the leader only for each group, and this role is exchanged in each share.

• Naming the group: The researcher put forward a set of names to the students, and in each group, the majority of them were taken in choosing a name for the group, respectively (heroes- federation- success- brave), and this was with the desire of all students to achieve the response and suspense of the work that will be with them.

After that, the cooperative lesson was applied, and we point out that the course of the session was presented with a problem by the school and followed by a set of steps with an exercise in each share of (10 to 15 minutes) and the

cooperative lessons and the cooperative lessons

-Third level:

The post -measurement application, "Creative Thinking Test", where the test forms were distributed to the members of the Dishes, and the time to answer them was estimated at (40 minutes), after which the same tribal measurements were followed.

3-9- Statistical methods

It is considered one of the important aspects of the study (Jaber Abdel Hamid: 1989) because it achieves the goal that it is not wanted to achieve, which is to reach quantitative results that help in analysis and interpretation, and the researcher used the statistical bag through the "SPSS" program version 17.

4- View and discuss results

4-1 View the results of the first hypothesis test:

The hypothesis stipulated that there are statistical differences in the degrees of the experimental group students in the creative thinking test in favor of the post -measurement, so the results were as follows:

Table (4)

Shows value of "T" for significance of difference in grades of experimental group students between tribal and post- test measurement

Groups	Median degree	Standard Devotion	T value	sig	Level of difference	T Value sig
Tribal test	67.50	24.9	5.34	0.01	14	moral
post- test	83.44	25.1				

From table (4) it appears that the value of the average arithmetic in the creative thinking test is 76.50 for tribal measurement in the experimental group and 83.44 for the post -measurement with a standard 24.9 for tribal measurement 25.1 for post-test measurement. The value of (T) 5.34, which is a statistical function at the level of significance 0.01, and from it we conclude the realization of the first statistical hypothesis.

4-1-1 View the results of the second hypothesis test:

Hypothesis stipulated the existence of statistical differences between the degrees of the students of the control and experimental group in the post measurement, so the results were as follows:

Table (5)

Shows value of "T" to significance of difference between grades of group and Experimental group in post –test

Groups	Median degree	Standard Devotion	T value	sig	Level of difference	T Value sig
Tribal test	50.71	36.11	52.3	0.01	15	moral
post- test	37.93	22.05				

from Table (5) that the value of the average arithmetic in the post -creative thinking test amounted to 71.50 in the control group of 93.37 in the experimental group and a standard deviation of 11.36 in the control group and 22.05. For the experimental group. While the value of (T) reached 3.52, which is a sign of the significance level of 0.01, and this indicates the presence of statistical differences between the average degrees of the control and experimental groups in the sub -dimensional thinking test in favor of the experimental group, from this proposal we conclude the achievement of the second statistical hypothesis.

4- 2 Analysis and Discussion of Results Study:

Discussion of the first irritating hypothesis:

First statistical hypothesis stipulates the existence of statistical differences in the degrees of experimental group students between the tribal and post - test measurement. The results of Table (4) confirmed the presence of statistical differences in the degrees of the experimental group students in favor of post -measurement.

While the teaching of physics contributes to the use of cooperative learning strategy in developing creative thinking, and this is due to the positive and active role of the student in the educational process through teamwork and participation in the small group within the strategy used, this is confirmed by Khair al -Din Henna, "that cooperative learning leads to events Interacting between students, he grows the ability to Cooperation and synergy in solving problems, and fights isolation, and self -confusion.

Where cooperative learning is new to students and new raises interest and suspense

Various teaching and various methods of presenting academic subjects in general and physics in particular that would develop thinking of all kinds (Fathi Al -Zayat: 2004) in addition to that they found pleasure in using this method because they are accustomed to self -reliance in knowledge, assimilation, application and thinking, as they used different mental skills (Like observation, analysis, classification, prediction, and design) While this method makes the student the focus of the educational process, and the teacher is a guide, supervisor and directed during the learning process, and this may have increased the feeling of students 'sense of self -reliance) Therefore, their effectiveness and interaction increased in the way they learned, and thus developing the skill of their creative thinking, this is what the researcher noticed while applying the cooperative lesson using cooperative learning stroke.

researcher also believes that the cooperative learning strategy applied in physics that students practiced effectively contributed to developing fluency capacity, and this is by providing sufficient opportunities for the possibility of generating multiple ideas that contribute to developing their fluency capacity (Abu Allam & Raja Mahmoud: 2004), and flexibility in Eating ideas and originality in their presentation, as cooperative learning aims to obtain the largest possible amount of ideas related to the educational task they were assigned to and the good exploitation of ideas collected during the class with intolerance in dealing with them, and the uniqueness in the quality of its formulation and productivity.

4-2-1 Discussion of second Irrigation Hypothesis:

second statistical hypothesis stipulates existence of statistical differences between degrees of students of control and experimental group in the dimensional measurement at the level of significance (0.01), and by using the "T" test, the results of the table (6) demonstrated the presence of statistical differences between the degrees of the students of the control and experimental group in the post measurement.

This indicates that the cooperative learning strategy gives students an opportunity to show their potential energies and abilities during their expression of their interaction between some of them in the classroom, this is what we find relatively embodied in the traditional method of teaching (Mahmoud Al -Rubaie: 2011).

This effect may be due to the nature of the experimental treatment that the students were

exposed to during their embodiment of the share of physics in the way of cooperative learning, this led to an increase in motivation and enthusiasm and their participation, (Ibrahim Al -Qudah & Basil Al -Rawashda: 2003) and thus they have improved the ability to skills of cognitive activity

The reason may also be due to the fact that this strategy, which was applied in physics by distributing students in small, homogeneous groups that provided them with sufficient opportunities for the possibility of generating amazing, unfamiliar and authentic ideas that contributed to developing their ability to think creative (Muhammad Al Saadi: 1993), through the applied strategy made The educational position is more interesting and enthusiastic for students, which made them accept the study of educational units without fear of failure (Yahya Nabhan: 2008). The students teach them the responsibility of learning them with themselves, as they allowed them to study in an atmosphere of fun, pleasure, familiarity, rapprochement and cooperation with each other (Ghazi Tashman: 2011), which led to the removal of the boredom and boredom barrier from interacting with a professor of physics and achieved the underlined goal of implementing the strategy, i.e. Students were observed through the post -measurement that have an increase in the degrees of creative thinking and cognitive activity.

While the control group studied in the normal way and the professor played the role of prompter for information and students, two futures with a lower interaction in its percentage from the group of students who learned with the strategy of cooperative learning, which reduced the opportunities for dialogue and discussion among them because the professor even if they were allowed to discuss, its duration is very brief and this is a desire In completing his lesson.

5- Conclusions & Recommendations

5-1 conclusions:

1-Need to use different and varied methods and methods and not be satisfied with only one way in teaching scientific subjects. This is what modern theories urge in teaching science.

2- Necessity of keenness by the professor in the participation of all members of the cooperative group in resolving the activity assigned to them.

3- Attention to the prevailing atmosphere in the teaching ranks and providing the necessary equipment, including bringing a professor efficient in providing a cooperative lesson using cooperative learning strategy, stimulates these students to creativity.

4- Reducing the density of the academic content of some curricula by giving an opportunity to the professor using methods and strategies to develop creative thinking.

5-2 Recommendations:-

1- Necessity of conducting more on cooperative learning strategy on large samples, in order to confirm the effectiveness of this strategy by achieving positive results in the field of teaching

2- Conducting a study to reveal the effectiveness of cooperative learning on the development of other higher thinking such as: critical thinking, scientific thinking, solving problems in physics or in other subjects with various teaching strategies.

3- Using other methods and teaching methods to develop thinking capabilities such as: individual learning, competitive learning, brainstorming, problem solving.

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Appendix (1)
A model of educational units for students

Cooperative goals	1- Positive mutual dependence in: mission, goal, information, reward. 2- Individual responsibility in: the final result, calendar. 3- Direct interaction face to face: between one group and groups as a whole. 4- Treating the work of the group: In order to determine the useful and useless actions and decision-making with the emergence of the work that continues to work and that will be changed.
Lesson implementation procedures With cooperative learning strategy	-Distributing students to (04) groups consisting of each group (04) students, and appoint the leader for each group. -Name each group. - Preparing the classroom. - Preparing to the lesson, by reminding the definition of the water solution, its components, and the types of water solutions. - The professor distributes the working papers coupled with the instructions of their implementation, after which the text of the exercise is written on the blackboard. - The professor asks the students to start the answer and reminds them of the time allocated for it 15 minutes at most, as well as reminding them of the principles of cooperative learning. - The leader of each group explains the exercise to the members of his group. The professor is confirmed by the groups' understanding of the exercise. - The professor inspects groups from time to time to make sure that each member assisted while codifying observations about teamwork in each group. -Each group records the results of each member - The results of each group are displayed. Discuss all results to reach the most health and clear result - The groups are evaluated by giving a degree to each group that answered a correct answer to the exercise as a whole group degree as a whole is the degree of each member of the group. The professor offers the correct feedback when the students make a mistake in the solution not to follow The correct solution steps. Announcing the arrangement of groups.

ملحق (1) نموذج من الوحدات التعليمية للطلاب

الأهداف التعاونية	1-إعتماد متبادل إيجابي في: المهمة، الهدف، المعلومات، المكافئة. 2- المسؤولية الفردية في : النتيجة النهائية، التقويم. 3- التفاعل المباشر وجها لوجه : بين المجموعة الواحدة والمجموعات ككل. 4- معالجة عمل المجموعة : وذلك لتحديد التصرفات المفيدة وغير المفيدة واتخاذ القرار بنشأة التصرفات التي يستمر العمل بها والتي سيتم تغييرها.
إجراءات تنفيذ الدرس باستراتيجية التعلم التعاوني	04-توزيع التلاميذ إلى (04 مجموعات تتكون كل مجموعة) تلاميذ، وتعيين القائد لكل مجموعة. -تسمية كل مجموعة.)الأبطال، الاتحاد، النجاح، الشجعان(. - تجهيز غرفة الصف. - التمهيد إلى الدرس وذلك بالتذكير بتعريف المحلول المائي ومكوناته وانواع المحاليل المائية. - يقوم الأستاذ بتوزيع أوراق العمل مقرونة بتعليمات تنفيذها، وبعدها يكتب نص التمرين على السبورة. - يطلب الأستاذ من التلاميذ البدء في الإجابة ويذكرهم بالوقت المخصص لها 15دقيقة على الاكثر كذا تذكيرهم بمبادئ التعلم التعاوني. - يقوم قائد كل مجموعة بشرح التمرين لأعضاء مجموعته . - يتأكد الأستاذ من فهم المجموعات للتمرين. - يتفقد الأستاذ المجموعات من حين لآخر للتأكد بأن كل عضو يقوم بالمساعدة مع تدوين الملاحظات حول العمل الجماعي في كل مجموعة . -تقوم كل مجموعة بتدوين النتائج التي توصل إليها كل عضو فيها - يتم عرض نتائج كل مجموعة. - مناقشة جميع النتائج للوصول إلى النتيجة الأكثر صحة ووضوح - يتم تقويم المجموعات وذلك بإعطاء درجة لكل مجموعة اجابت اجابة صحيحة للتمرين ككل درجة المجموعة ككل هي درجة كل عضو في المجموعة . - يقدم الأستاذ التغذية الراجعة الصحيحة عندما يخطأ التلاميذ في الحل في عدم اتباع خطوات الحل الصحيحة. - الإعلان عن ترتيب المجموعات .