

# Study and analyze the results achieved from adopting and implementing the learning Strategy together to understand and comprehend the Science subject (chemistry) for the second intermediate grade

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**Abstract:**

*The current research aims to study and analyze the results achieved from adopting and implementing a learning strategy together to understand and comprehend the science subject (chemistry) for the second intermediate grade by verifying the following null hypothesis:*

*There is no statistically significant difference at the level of (0.05) between the average scores of the experimental group students who study the science subject according to the learning strategy together and the average scores of the control group students who study the same subject in the usual way.*

*The research sample consisted of (44) students from the second intermediate grade, and by (21) students for the experimental group that studied science according to the learning strategy together and (23) students for the control group who studied in the usual way.*

*The researcher was rewarded between the two groups of research in the variables (age in months, previous academic achievement in the science subject for the first intermediate grade, parental achievement).*

*The researcher prepared the teaching plans for the topics of the second and third semesters of the science textbook for the second intermediate grade.*

*The two groups studied for a period of (4) weeks, and after completing the teaching, the achievement test was conducted for the students of the research sample, and the results indicated that there were statistically significant differences between the average achievement of students who studied science using the learning strategy together and the average achievement of students who study science in the usual way in favor of the experimental group. In light of the research findings, the researcher recommended a number of recommendations, including:*

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*1-The constant involvement of teachers in courses, seminars and lectures with educational goals related to modern methods of teaching.*

*2-Training science teachers on how to use learning strategy together in teaching.*

*3-Conducting similar studies on larger samples and in a varied study item.*

**Key words:** *Learning , Strategy together ,Chemistry .*

## **I. Introduction**

The purpose of the educational process is to make changes in the behavior of the learners. The teacher carries a noble message, so he must be serious and loyal to this message, understanding the responsibility entrusted to him. The main goal of learning science is to focus on the way individuals think, not how to memorize vocabulary and curricula without knowledge or understanding.

Through the researcher's work as a school in the intermediate and preparatory stages, she noticed that the method of teaching science is often static, and that there are academic problems, learning difficulties and frequent mistakes that students fall into, especially in recent years, as our middle schools have adopted new science content with many and varied concepts. Academic problems have importance in developing and improving the educational process, after the traditional education patterns have become incapable of keeping pace with the large variables.

The researcher believes that the teaching method is responsible for processing the textbook difficulties, poor students' level, the scientific article are not theories and ideas, but they mean a teacher of familiarity of the students, and the way an objective of exposure by which scientific material.

### **Research significance:**

The emergence of recent trends in science education urging the use of new methods to identify their impact on increasing student achievement, instilling a spirit of cooperation between them and gaining educational experiences.

### **Research Goals:**

The current research aims to study and analyze the results obtained from adopting and implementing a learning strategy together to understand and comprehend the science (chemistry) subject for the second intermediate grade.

### **Research hypothesis:**

To verify the research objective, I put the zero hypothesis. There is no statistically significant difference at the level of (0.05) Between the average scores of the experimental group students who study the science subject according to the learning strategy together and the average scores of the control group students who study the same subject in the usual way.

**Research limits:**The current search is limited to:

1-Students of the second intermediate grade of Al Buruj Intermediate School of the General Directorate of Education in Diyala for the academic year(2018-2019)

2-The first semester of the academic year(2018-2019 )

-The second and third semesters were chosen

-Chapter Two: Chemical Compounds.

-Chapter Three: Chemical Formulas and Reactions.

### **Definitions of terms:**

#### **1-A learning strategy together:**

Strategy developed by (Johnson & Johnson, 1975 )It emphasizes strengthening the skills of verbal interactions between students in small groups of(2-4)Individuals to achieve specific skills, and each student is assigned a specific role, such as (leader, summary, reader, ...). Each group is given a work plan that includes goals, questions and educational activities, and the teacher rewards the group as a whole, and students in it are subjected to an individual test in addition To the group calendar as a whole(Al-Rubaye,1999, P:6)

#### **Procedural definition / learning strategy together:**

A teaching strategy that allows students to participate and learn with each other in small groups that include each group) 4Students who perform educational activities together under the guidance and assistance of the teacher to achieve the desired goals.

#### **2 .Comprehension and understanding:**

A level of the cognitive domain that refers to the ability to understand the subject matter, topic, or ideas that the learner is exposed to without necessarily implying his ability to relate them to other information and ideas) (Samara and Al-Adili,2008,38 )

Gordner defined itUnderstanding that: the ability to acquire knowledge, skills, and concepts, and then apply them to new situations (Nofal and Faryal Muhammad,2011,295)

#### **Procedural definition of comprehension:**

The ability to understand what the student is studying, which makes his learning useful, that he can use and apply in his life situations.

#### **Previous studies:**

The researcher was acquainted with a number of studies and scientific researches that dealt with the study of learning strategy together. Studies related to some aspects of the current study have been found in terms of the design of the research methodology, some of its procedures, and the choice of statistical means.

#### **The study of the Sheikh, Sami Saleh Ahmed,1993:**

The study was conducted in Jordan on a comparison between the strategies of cooperative learning and learning by the traditional method in the achievement of basic fifth grade students in the subject of science. The sample consisted of(106) Male and female students) divided into four classes in two schools, one for males and

the other for females, and students' achievement was measured by means of a multiple-choice achievement test. Students in the gender variable or the interaction between method and gender (Sheikh, 1993, 2)

(Krishnan, 1991).

The study was conducted in the United States of America, and it aimed to identify the differences between achieving conceptual change between chemistry students who work together in cooperative groups on using problem solving, and chemistry students who work individually to use problem solving. The study consisted of (84) Male and female students, the experiment lasted the first semester, and the data were analyzed statistically using the analysis of binary variance, and the study showed a great ability to change the concept within the experimental group compared with the control group study (Krishnan, 1991, p: 870) (Lord, 1994)

This study was conducted in the United States of America, and it aimed to investigate the effect of using cooperative learning in teaching science for secondary and higher grades.

The research sample consisted of (50) One of the science teachers, the data were analyzed statistically using the T-test, and the results showed a statistical significance when attitudes and tendencies changed positively towards using the cooperative learning method in teaching (Lord, 1994, p: 280-284)

## II. Theoretical framework:

**Cooperative learning** : a method of teaching in which students learn as a team in small groups to complete a specific assignment, in which they learn positive coping skills (Matirn & Schletle, 1995, p: 170)

This method is considered one of the modern methods derived from progressive education, as it takes into account the individual differences between students and gains them confidence in themselves and makes them feel reassured (Abdul Hadi, 2000, p183)

Learning through the cooperative learning method aims above all at academic achievement related to the subjects taught through it (Kahila Bose, 2010, p364)

Cooperative learning has actually been applied in the teaching of mathematics and science, but few teachers have used it as a main teaching method for special reasons related to designing the classrooms and providing the necessary administration, devices and statistical tools, in addition to the poor preparation of teachers and their lack of training in the procedures of this method (Battistich & Athers, 1993, p: 91).

The process of planning and supervising the cooperative groups is based on the following pillars:

1-Positive collaborative solidarity : The success of the group depends on the success of each member in it, by defining common goals and the role of each individual in achieving this, and therefore each individual does his best to help others succeed.

2-Direct interaction between students: Students engage in direct verbal activities through dialogue, discussion and exchange of views. It also requires the teacher to follow them up and provide them with timely feedback.

3-Individual responsibility :It bears each individual in the group the responsibility of mastering the educational material, and actively contributing to its achievement, especially since the evaluation is based on an individual and group basis.

4-Collaboration skills: It requires the use of interpersonal skills, listening to and respect for their opinions, and the ability to express ideas.

5-Group treatment :It is an analysis of the work of the small cooperative group in terms of the degree of effectiveness and the use of skills and requires the teacher to follow up the work of the groups( Fatima Khalifa,1992 ,200-201) (Al-Harmzi,1992,5-6)

Cooperative learning strategies:

Several studies and research have identified collaborative strategies, including:

1-Structural strategy.

2-Learning together strategy.

3-Learning Team Strategy.

4-Strategy for collection teams.

5-Crop strategy.

In order to avoid the repetition of talking researcher will address the learning strategy together only.

#### **Learning together strategy Learning Together:**

This strategy has proven a high competence in achievement and in developing motivation among learners in addition to providing them with social skills through a number of research and studies, and this is confirmed by the analytical study he conducted (Johnson & Johnson & Mary, 2000, p: 13)

#### **Research procedures:**

##### **First: Experimental Design:**

Experimental design means planning the factors surrounding the phenomenon you are studying in a specific way and observing what is happening( Aziz Hanna and Anwar Hussein,1990,p:256)

The researcher adopted an experimental design with partial control that she deems appropriate for her research conditions , and the design came with the final achievement test.

##### **Second: The Research Sample:**

###### **1 .Research community:**

The medium mixed zodiac choice to be the field of research ,deliberately , in a way that the researcher E .end Z teachers school, has shown the school readiness to cooperate with the management, and the presence of three divisions in which the second grade average (two divisions for boys and the Division for Girls , (which helped to choose the two sets of experimental research and control is what I mean, Most students are from one geographical area, and then their economic, social and cultural levels converge.

## 2 .Research sample:

Division (A) and Division (B) were chosen from the second intermediate grade classes intentionally to be the research sample, then Division (A) was appointed to represent the experimental group, and Division (B) to represent the control group, the number of students of the experimental group was(21)Student, Control Group(23)A student, and the number of students(44) Student.

### Third: Equivalence procedures for the two research groups:

Although the members of my group were chosen from a homogeneous environment and from one gender and one academic community, and for the purpose of obtaining equal groups and for the purpose of controlling some of the variables that affect the results of the experiment, the researcher conducted a parity process between groups in several variables (science degrees for the first intermediate grade for the year 2017-2018 ,Chronological age calculated in months, the parents 'academic achievement). The researcher selected data on variables from the school card and the grades record in cooperation with the school administration.

### 1-Science degrees for the first intermediate grade:

The mean scores for the experimental group(59.9) And standard deviation (10.8) ,While the average scores of the control group (63.69) And standard deviation (15.78)And by using the T-test to find out the significance of the differences in science scores for the first intermediate grade, it appeared that the difference is not statistically significant at the level of significance(0.05) ,As the calculated T value (1.50) Less than the mature tabular value (2.0021) And a degree of freedom 58 ,Which indicates the equivalence of the two research groups, and the table(1)This shows: schedule(1)

The arithmetic mean, standard deviation, variance, and the calculated and **tabular T value of the scores of the two research groups in the science subject for the first intermediate grade**

Significance when (0.05)	T-value		variance	standard deviation	SMA	The number of students	the group
	Tabular	Calculated					
Not a function	2.002	1.50	117.27	10.8	59.9	21	<b>Experimental</b>
			249.03	15.78	63.6	23	<b>Control</b>

### 2 .Calculated chronological age:

Information related to this variable was obtained from the school card, where their ages were calculated in months up to 30/12/2018 ,As the average age of the experimental group was reached (175.6) And standard deviation (13.31) ,While the average age of the control group students (170.9) And standard deviation (13.26) , And using the test Altai of two samples of six Qlten to know the significance of differences between the ages

of two groups of students research shows no difference with statistical significance at the level of(0.05) Which indicates the parity of the two groups search table (2).(schedule)

**The arithmetic mean, standard deviation, variance, and the calculated and tabular T-value of the two search groups for age in months**

Significance when (0.05)	T-value		variance	standard deviation	SMA	The number of students	the group
	Tabular	Calculated					
Not a function	2.002	1.15	177.4	13.31	175.6	21	Experimental
			176.04	13.26	170.9	23	Control

**Parents' educational level:**

**1-Parents' academic achievement :**The results showed that the two groups are equal in the academic achievement of the fathers, as it reached  $(K^2)$  (Calculated (2.14) It is smaller than the value of  $(ka^2)$  (Tabulated (7.812) At the indication level (0.05) And a degree of freedom (3) Table (3) Illustrate it.

**2- Mothers' educational attainment :**The results also showed that the two groups are equal in mothers' educational attainment.<sup>2</sup> (Calculated (3.57) It is smaller than the value of  $(ka^2)$  (Which is smaller than the value of)  $Ca^2$ Scheduling (7.812) At the indication level (0.05) And a degree of freedom (3) Table (3) Explain it

**3-Table(3)**

**4- Repetitions of academic achievement of the parents of students** of the two groups of research and value  $(Ca^2)$  Calculated and tabular

Statistical significance	Ka value <sup>2</sup> Tabular	Ka value <sup>2</sup> Calculated	Degree of freedom	University	Preparatory or institute	Average	primary	the group	Variable
Not a function	7.812	2.148	3	2	4	4	11	Experimental	Parents' academic achievement
				4	5	4	10	Control	
	7.812	3.27	3	1	0	2	18	Experimental	Parents' academic

				0	2	3	18	<b>Control</b>	<b>achievement</b>
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### **Search Supplies:**

#### **1 .Determine the scientific material:**

The second and third chapters of the Science Book for the second intermediate grade have been determined and are:

Chapter Two (Chemical Compounds)

Chapter Three (Chemical Formulas and Reactions)The reason for choosing these subjects is that they include many and varied concepts that are closely related to the later stages of study, and which students often find difficult to understand and grasp.

#### **2 .Formulating behavioral objectives:**

The purpose of the behavioral goals is to enable the teacher to know what he wants from his students at the end of the class( Al- Khalili,19996,p:77)

The content of the second and third semesters to be taught during the duration of the experiment was analyzed, and (25)A behavioral purpose , the researcher adopted the cognitive Blum classification in its first three levels, the behavioral objectives were presented to the experienced and specialized appendix(1)For the purpose of judging the accuracy of its formulation, clarity and extent of its coverage of the teaching content, and in light of their opinions, amendments were made, and the number of behavioral purposes became20A behavioral purpose.

#### **3 .Preparing teaching plans:**

The researcher prepared a set of teaching plans at the rate of two teaching plans per week according to the steps of the Collaborative Learning Together Strategy Appendix(2) ,(Also included teaching plans for the control group in a way t t fit with buil the Ge regular supplement (3 )It was presented to experts and specialists to express their views on the validity of the plans and their compatibility with the content of the article, and those plans have obtained the majority agreement, and by this the integrity of the plans was confirmed(1)

#### **Search tool:**

Achievement tests are measures to reveal the impact of science or special training, and this term is used for all the forms and types of tests that he prepares (Farah Taha,1987,19)

The achievement test included objective questions of the multiple-choice type, as this type of paragraphs is characterized by objectivity, where the score is appreciated away from the subjectivity of the corrector(Thaer Ghobari and Khaled Abu Shaira,2008p:415)The number of multiple choice paragraph(25)Paragraph, presenting the test to a group of experts and specialists for the purpose of verifying its validity, and based on their observations, the researcher made some amendments to the test and it remained(20)Paragraph for each paragraph one score for each correct answer appendix(4).



**Experience application:**

The experiment began in(27/11/2018)And the period of application took(4 (Weeks according to the following steps:

1-The research sample was taught using the Learning Together strategy, as it was taught by the subject's teacher at the rate of two classes per week, as the students were distributed into small, heterogeneous cooperative groups, each group consisting of) 4)Members and roles were distributed to students.

**Statistical means:**

The two researchers used to process the data statistically using the ready-made statistical program for social sciences, which is known as(Spss-x)

**III. Display results:**

For the purpose of verifying the zero hypothesis , the arithmetic mean, standard deviation and variance of the scores of the students of each of the experimental and control groups were calculated in the achievement test table Table(4)schedule(4)

The arithmetic mean, standard deviation, and the calculated and tabular T value of the scores of the students of the experimental and control groups in the achievement test

Significance when (0.05)	T-value		Degree of freedom	variance	standard deviation	SMA	The number of students	the group
	Tabular	Calculated						
Function	2.002	3.75	58	8.1	2.82	14	21	Experimental
				5.78	2.38	11	23	Control

As can be seen from the table) 4)That the average scores of the experimental group students in the achievement test(14 (And standard deviation) 2.82 ,(While the average grades of the control group students were) 11 (And standard deviation) 2.38And by using the T-test, it is found that the calculated T value) 3.75)It is greater than the tabular value of the amount(2.002 (At the significance level (0.05) This means that there is a statistically significant difference between the experimental and control groups in the averages of achievement. Thus, the experimental group whose students studied according to the learning strategy together is superior to the control group whose students studied in the usual way of achievement.

**Interpretation of the results:**

It is evident from the findings of the current research that the use of a learning strategy together in teaching science (chemistry) has a positive effect on increasing academic achievement among second-grade

intermediate students, and this can be attributed to the fact that cooperative learning raises achievement to its highest levels compared to competitive learning. And individual learning over the different ages (Kagain, 1989, p: 9 ).

In addition, the individual feels his value and importance through the success of the work assigned to him ,which in turn leads to the success of the work as a whole, and vice versa( Al-nashiq,2008,85)

The human being is social by nature, and the human personality grows through the interaction that takes place in human society (Al-Badri,2009,p:117) As though the feeling of each student leadership in an effective manner in the educational process led to an increase of students to love their school and consider it a place where loving group of individuals seeking work to achieve better learning for each of them(Aumira Fathi Deeb ,1967,14)This method in teaching making the material more exciting and fun for the students, and this is what the researcher touched by the enthusiasm of the students of the material and their attention to the lesson, which helped to overcome the boredom associated with the teaching of science in a way routine.

This result may be attributed to the effectiveness of the learning strategy together in enhancing the student's active role in learning. It enabled him to understand concepts and gave him an opportunity to express what is in the student's mind and think out loud.

#### **IV. Conclusions:**

1-The effectiveness of the learning strategy together in building social relationships for students with each other.

2-Increasing student self-esteem and self-confidence, and increasing the sense of responsibility entrusted to him.

3-The effectiveness of the learning strategy together helps in understanding concepts and processing information personally and collectively.

4-The learning strategy together achieves the active participation of students during the lesson.

5-Adopting a learning strategy together leads to a good assimilation of information for students.

6-The learning strategy together led to an increase in students' understanding of science (chemistry) and motivated them.

7-Learning strategy together helps to stimulate memory among students and encourage them to apply.

#### **V. Recommendations:**

1-Continuous involvement of teachers in courses, seminars and lectures with educational goals related to modern methods of teaching.

2-Conducting similar studies on larger samples and in a variety of academic courses.

3-An inventory of the difficulties facing the use and employment of cooperative learning in the teaching process.

4-Work to provide learning resource rooms and equip them with all educational aids.

5-Training science teachers on how to use the learning strategy together in teaching.

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