PalArch's Journal of Archaeology of Egypt / Egyptology

THE EFFECTIVENESS OF ACTIVE LEARNING IN THE ACHIEVEMENT OF CHEMISTRY AND MOTIVATION AMONG INTERMEDIATE THIRD-GRADE STUDENTS

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Asst. Prof. Hiam Ghaieb Hussein, Afraa Sabri Mohammed, THE EFFECTIVENESS OF ACTIVE LEARNING IN THE ACHIEVEMENT OF CHEMISTRY AND MOTIVATION AMONG INTERMEDIATE THIRD-GRADE STUDENTS- – Palarch's Journal of Archaeology of Egypt/Egyptology 17(7) (2020), 1 ISSN 1567-214X.

Keywords: active learning, motivation, achievement

Abstract:

The study aims to show the effectiveness of active learning in increasing the motivation and achievement of third -grade intermediate students in the section of chemistry, the research sample consists of (40) students divided into two equal groups, one experimental and the other control, and the research tools consisted of an achievement test of the multiple choice type, and the motivation scale among students, and after statistical treatment, the results of the research indicated that there is a statistically significant difference between the experimental and control group in achievement and the motivation scale for the benefit of the experimental group, and in light of the results, the researchers recommended paying attention to develop the achievement and motivation of students simultaneously since each of them can serve the other and the need to consult behavior students and their rush to pay attention to the educational position.

Research Problem:

Through the modest experience of researchers in the field of teaching, conducting field visits to some schools, and seeing the most important problems of the educational process, the research problem is represented in the low level of achievement and motivation in chemistry for middle third grade students, as it was found that most of the teachers lacked modern teaching models and methods. And relying on traditional methods based on memorization, indoctrination and rote memorization in teaching chemistry which do not give students the opportunity to actively and effectively participate in the learning and education process, due to the lack of informing

them of the models and modern methods in the teaching of chemistry, which led to the low level of achievement and motivation towards the chemistry of the average third - grade students, and in view of the development in all spheres of life In general, and chemistry in particular, it has become necessary to make a change in the curriculum of the educational process in terms of its methods, methods, means and activities.

In order to address this weakness and decline in student achievement, activate their role, activate their scientific effectiveness and increase the collection of information and their motivation towards it so that their activity is central and essential and they are the focus of the educational process and the teacher's role is limited to guidance, follow-up and counseling, the two researchers see the need to use modern strategies in teaching chemistry, including strategies Active learning.

According to the above, we find that the research problem lies in the following question:

What is the effectiveness of active learning in achieving chemistry and motivation among intermediate third-grade students?

Research Significance:

The method of the lecture is the way the prevailing teaching this method does not contribute to real learning As a result, multiple ideas and frequent calls appeared to develop frameworks DONC s teaching involve the learner in learning, a teacher creator can compensate for any shortage or shorten the potential in teaching activities and behavior of classroom teacher requires Creativity in classroom management in terms of flexibility and sensitivity to the educational patterns of individual and group students (Abu Shaira, Thaer Ghobari, 2010, 167). The teaching profession is mental and procedural processes and activities in which knowledge is transformed into practical skills in the end, which work to change behavior as a result of gaining experience

(Saadi, Tamimi, 2014,24), and out of this interest in the process of teaching and learning has methods and modern teaching methods, as the numerous contemporary that are in harmony with the spirit of Alas R (Mohammed, 1988, 142).

And since chemistry is one of the living natural sciences that have importance in human life, educators have the responsibility to pay attention to teaching it and search for the best ways to teach it in line with the needs of learners and make continuous efforts to achieve better education through it learning. (Attar,1981, 38).

Science learning is an active process, and learners must be actively helped to understand it through individual and group activities during learning, and the necessity to encourage students to fully participate in science education, and to use multiple learning strategies. This increases the importance of applying active educational strategies that make learners in a state of activity and interaction so as to help gain them motivation as it is a basic requirement without it, the desired results will not be achieved via any educational system. Therefore, the importance of research is presented.

Thus, the current research agreed with the recent trends:

1-that seek to experiment with new strategies, including active learning.

2-The middle school stage coincides with adolescence, which is considered a critical stage in which the student becomes less motivated to learn and his academic achievement decreases.

3-The results of this study can benefit those in charge of the educational process in the curricula and methods of teaching scientific subjects, especially chemistry.

Research Goals

The current research aims to:

1- Recognize the effectiveness of active learning in chemistry achievement among third-grade intermediate students

2-Identify the effectiveness of active learning in motivation towards chemistry among third-grade intermediate students.

Research Hypotheses

To achieve the goals of the research, the study suggested the following hypotheses cases:

-There is no statistically significant difference at the level of significance (0.05) between the average achievement scores of students who study through the active learning method and the average scores of students who study in the traditional way in the achievement test.

-There is no statistically significant difference at the level of significance (0.05) between the average grades of students who study using the active learning method and the average scores of students who study in the traditional method on the scale of motivation towards chemistry.

Research Limits:

The current research is limited to:

1.Intermediate third -grade students in the day schools of the General Directorate of Diyala Education for the academic year (2019-2020)

2. The first semester of the academic year (2019-2020).

3.the atomic structure of the substance , (the first and second groups) , (the elements of the third group and aluminum .(From the book of chemistry scheduled third grade average , for the year 2018

Definitions of terms:

Potency Effectiveness

It Knew everyone (Kojack,1997). The degree or extent of congruence between the actual outputs of the system and the desired or desired output, in the sense of comparing the results with the objectives (Kojak 1997, 230).

Keys, L, M (2009)

The extent of the effect that an experimental treatment can have as an independent variable on one of the dependent variables) (Keys,2009).

Procedural definition:

The magnitude of the impact of the proposed strategy to increase achievement and motivation towards chemistry on the third intermediate students using active learning.

Active learning: Active learning

-It was known by both (Saadeh et al., 2006)

A learning and teaching method where students participate in activities and exercises very effectively through a rich and varied learning environment, with a teacher encouraging them to take responsibility for learning themselves under his supervision and pushing them to achieve the desired goals (Saadeh et al, 2006, 33)

-Hashemi and Dulaimi, (2008)

The set of procedures and practices that the teacher follows in the classroom to reach outcomes in light of the goals he has set. It includes a set of methods, means, activities and evaluation methods that help achieve the goal (Al-Hashimi and Al-Dulaimi, 2008, 19).

Procedural definition:

A method of learning in which a group of different activities are used that make the student more effective instead of the traditional method

Motivation:

And it was known by everyone (Qatami, 2000): An internal stimulus that drives individuals' behavior and directs them to reach a specific goal (Katami, 2000, 277).

An internal state of the individual that stimulates his behavior, works to continue and directs him towards a specific goal in order to achieve it (Kahila Booz, 2011, 72).

Procedural definition: It is an internal or external condition that provokes the behavior of the learner and pushes him to pay attention to the educational position and to continue the activity until the learning is achieved.

Attainment Achievement

And he knew all of - Webester

That the student's achievement, qualitative and quantitative, during a particular semester (Webester, 1971, p16).

-Alam, (2000)

It refers to the degree of student acquisition that an individual attains or the level of success that he or she attains in a subject, educational field, or specific teaching (Alam, 305, 2000).

Procedural definition:

The two test tastiest Connect the student in the which sih is a degree to Sih For this purpose researchers prepared it .

Theoretical framework:

The science curriculum at different educational levels of the areas that could be available through which the active educational environment, where stop learning facts and concepts, principles and theories of science to the practice of activities and experiences that require work.

Active learning falls under the constructivist theory as it focuses on the need for the learner to be active and make a mental effort to reach the discovery of knowledge by himself .And teaching methods in the light of active learning are based on effective participation between teachers and learners.

Active learning is based on building meaningful experience situations that the learner passes through, requiring them to work in small groups, so they engage in their operations and activities and arrive together to solve problems and accomplish tasks (Al-Saghir, 79, 2009).

And (Abu Al-Jabeen, 2014) indicates that the effective learning environment differs from the traditional learning environment in that it is characterized by openness and understanding, as it is an intellectual system and a set of practices (Abu al-Jubein, 2014).

Recent trends have recommended that the classroom environment and the material supportive of the use of active learning is what classrooms contain from group tables and movable chairs to allow for changes in the arrangement of the classroom (Saadeh et al., 33, 2006).

Active learning is based on two basic assumptions:

1. Active learning is an active attempt by the learner.

2.Different individuals learn in different ways(El-Sherbiny and Effat, 506, 2011)

And active learning is important, including:

1.Development of social relations among student.

2.Helps change the teacher's image as the only source of knowledge (Awad and Majdi, 28, 2010).

3.It provides students with a rich environment full of challenging situations that stimulate them to think and participate actively and positively.

4. Increasing students 'retention of knowledge (Khairy, 32, 2018).

The teacher has a role in active learning, including:

1. Taking into account individual differences between students.

2.Helping students discover knowledge and information on their own.

3. Taking into account the complementarity of the different academic subjects (Badir, 2008).

Al-Shammari points out that it is important for the teacher to realize well that active learning strategies are nothing but auxiliary tools that he uses in order to achieve better student learning, and that the strategy is not the ultimate goal of learning, as many teachers believe that once the strategy is applied, students learning is guaranteed

This belief is undoubtedly a false belief and may reflect negatively on the learning processes (Al-Shammari, 18, 2011).

The need for active learning has arisen by several factors, the most prominent of which are: the state of confusion and confusion that learners complain about after each educational situation, or that can be explained after each educational situation, or that can be interpreted as a result of not truly integrating new information into their minds after each educational activity, which is what It led to a change in the course of education and made it based on various activities (Awad and Majdy, 20, 2010).

The motivation to learn is one of the reasons for the student's success, and it is no less important than his mental capabilities. Without it, the student does not make any effort to learn, so all educational institutions have been interested in studying it because of its effective role in achieving educational goals.

Motivation has basic functions:

1. Releasing the student's emotional energy and stimulating his activity

2.Defining and choosing an activity, motivation makes the student respond to learning topics and neglect others

3.Directing the behavior towards the goal to achieve satisfaction and satisfaction of the need and remove stress(Sebessian, 64-65, 2016).

Where research has shown that learners are more motivated when they see that there is a relationship and connection between what they learn and their needs and interests (Syed Ahmed, 25, 2008)

Indicates(Lepper ,2005) that when students are internally motivated, they are interested in and participate in what they learn, then they are active in processing information and tend to choose tasks that are serious and challenging and innovate in these tasks to reach a high level of achievement (Lepper , 2005, P687).

This is what was confirmed by(Kahila Booz, 2011) that the goal of every teaching is primarily to achieve and facilitate learning, and that the motivation to learn during it is a major matter because it increases its effectiveness and efficiency (Kahila Bose, 74, 2011)

Accordingly, the motivation for achievement includes five basic components:

- 1. sense of responsibility
- 2. The pursuit of excellence to achieve a high level of ambition
- 3. perseverance
- 4. Feeling the importance of time
- 5. Planning for the future (Khalifa, 17, 2006)

Previous Studies:

-A study of Tariq Al-Saoub (2014)

The study aimed to identify the effectiveness of a strategy based on some active learning methods for developing chemical concepts among tenth grade students in Jordan. The study sample consisted of (137) male and female students. The researcher built a strategy based on active learning methods to teach the experimental group, and the test was applied to chemical concepts It consisted of (48) items, and the results of the study indicated the superiority of the experimental group over the control group.

-A study of Al-Zoghbi (2017)

The study aimed to investigate the impact of teaching chemistry using the strategy (think, write, pair, share) in improving the basic tenth grade students' understanding of chemical equations and developing their motivation to complete classroom assignments. The study sample consisted of (70) students randomly assigned to two experimental groups and the number of their members (34), a female officer and a number of its members (36) students.

The researcher used the quasi-experimental approach, the test consisted of (20) items to measure the understanding of chemical equations, and a questionnaire consisting of (20) items was also prepared to measure the motivation to accomplish classroom assignments among the sample members.

-A study of Christian Son (1999)

The results of the study, which compared two groups of students, the first on which active learning was applied using small discussion groups, and the second adopted the usual teaching, revealed the effectiveness of the active learning group and that from the correct and accurate understanding of the concepts included in the topics of proliferation and absorption in the physics course unit, and the study recommended further studies About active learning in the different educational stages in various fields.

Search procedures:

First:Experimental design :The researcher followed the experimental design with partial control with a post-test.

Second: Research community and sample :The research community consisted of middle-grade third-grade students in Baqubah schools for the academic year(2019-2020).

Al Buruj medium was chosen to be the field of research in an intentional way, as one of the researcher Tan works in a school and the school administration expressed her cooperation, and the presence of three divisions in it for the third intermediate grade, which helped in choosing the two research groups randomly, and because the students were from one geographical area, and then their economic levels converged. And social

Third: Equivalence procedures for the two research groups Table (1)

The two groups of research are equivalent in previous achievement and age in months

Statistical significance	Tabular	t Values Calculated	standard deviation	SMA	Groups	Variables
Not a	2.002	1.19	12.06	71.55	Experimental N = 20	Previous achievement in science
function			8.68	67.4	Control N= 20	
		0.38	11.44	172.45	Experimental N = 20	Chronological age in months
Not a function	2.002		11.29	171.02	Control	
					n = 20	

Research Supplies

1.Determination of the scientific material : The first, second and third chapters of the chemistry book for the third intermediate grade have been determined, and they are

-Chapter One (The Atomic Structure of Matter).

-The second chapter (the first and second groups).

-Chapter Three (the third group and aluminum).

The reason for choosing these classes is because they include many and varied concepts that are closely related to the later stages of study.

2.Formulating behavioral objectives:

The first three semesters to be taught during the duration of the experiment were analyzed, and (100) behavioral objectives were formulated. The researcher adopted Bloom's cognitive classification, with its first three levels

The behavioral objectives were presented to experts and specialists along with the content of the scientific material Appendix (1) for the purpose of judging the accuracy of its formulation, clarity and the extent of its coverage of the teaching content, and in light of their opinions, amendments were made, and the number of behavioral objectives became (96) a behavioral purpose.

3.Preparing teaching plans:

In light of the content of the first three chapters of the chemistry book for the third intermediate grade and depending on the behavioral objectives that have been prepared, the researcher has prepared (16) teaching plans for the experimental group and (16) teaching plans for the control group have been presented to a group of experts and specialists, Appendix (1) Based on their proposals, the plans are in their final form, Annex (2)

Search tool:

1.Achievement test:

The achievement test included multiple-choice objective questions, each paragraph containing four alternatives, and this type of question is one of the most common. The number of multiple choice items reached (25) items. The test was presented to a group of experts and specialists for the purpose of verifying its validity. Based on their observations, the researcher made some adjustments to the test, and (20) items for each paragraph remained one score for each correct answer, Appendix (3)

-The test was applied to an exploratory sample consisting of (30) students. The pilot sample aimed to calculate the test time, calculate internal consistency coefficients, and calculate stability coefficients.

-Difficulty coefficients were calculated for the test items, and the difficulty coefficients ranged between (0.56 - 0.32), and the distinction coefficients ranged between (0.59-0.30). Therefore, all the items are acceptable **Stability test**.

Stability test:

To verify the stability of the test, it was applied to an exploratory sample consisting of (30) students without the research sample. The Kord-Richardson-21 equation was used and the value of the overall test stability was (0.79), which is considered an acceptable value.

2. Motivation scale:

After reviewing and reviewing the studies, scientific books, and data in the field of research, the researcher Tan was able to construct special paragraphs that took into account the purposes for which the test is used, and the scale consists of (20) paragraphs in the form of the triple scale (strongly agree - agree - disagree), Supplement (4).

Validation of the scale :

-The sca'le was presented to a group of experienced and specialized people to judge its paragraphs in terms of clarity of the paragraphs, the relevance of the paragraphs to the dimension and the linguistic wording, and in light of their observations, the necessary adjustments were made. Thus, the scale became composed of (20) paragraphs

Stability of the scale: The reliability of the scale

was verified by means of the Fakronbach equation after applying it to the same pilot sample consisting of (30) students and its value was (0.80) and is considered an acceptable value

Conducting the experiment:

After completing the preparation of the research tools and making sure of their validity and stability, the experiment was applied as follows.

1.The experiment started (3/10/2019) until (2020(\ 1 1/30).

2. The two groups of research were taught by the subject school at the rate of two lessons per week, as the number of lessons was (16) classes

3.At the end of the experiment, the achievement test and the motivation scale were applied

4. The answers were corrected and the data arranged for the purpose of statistical treatment.

Statistical treatments:

The two researchers used to process the data statistical program for social sciences which is known as(spss-x).

Display results:

For the purpose of verifying the theoretical grade Rayya which states $\$ that (there is no difference is statistically significant at the level (0.05) between the average scores of students who are studying the collection of active learning and the way the average scores of students studying in the usual way. The arithmetic mean, standard deviation, and value were calculated t For two independent samples as shown in Table (2).

Table (2)

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

		value -T			The		
	Tabular	Calculated	standard deviation	SMA	number of	number of the group	
	Tuounu	Culculated			students		
Eurotion	2 002	2.07	2.56	10.9	20	Experimental	
Function	2.002	2.97	2.91	2.76	9.8	20	Control

It is evident from the above results that the calculated value of (t) is greater than the tabular (t), and this means that there is a statistically significant difference between the experimental and control groups in the averages of achievement, and thus the experimental group that was studied according to active learning is superior to the control group that was studied by the traditional method of achievement.

2. Motivation towards chemistry:

For the purpose of verifying the second null hypothesis, which states that (there is no statistically significant difference at the level of significance (0.05) between the average grades of students who study by the active learning method and the average scores of students who study in the traditional method on the scale of motivation towards the subject of chemistry.

(Table3)

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

the group	The			value -T	
	number of	SMA	standard deviation	Calculated	Tabular
	students				
Experimental	20	45	5.63	3.06	2 002
Control	20	40	4.4	5.00	2.002

It is evident from the results presented above that the calculated value of (t) is greater than the tabular (t) in the motivation scale at a level of significance (0.05). This indicates that there is a statistically significant difference between the average scores of the experimental group and the average scores of the control group in the motivation scale in favor of the experimental group.

Interpretation of the results:

It is evident from the findings of the current research that the use of active learning in teaching chemistry had a positive effect in increasing the achievement of students of the third intermediate level. The statistical significance of the data can be explained as follows.

-Teaching chemistry according to active learning helps students to participat actively in the lesson, and also contributes to increasing motivation towards learning, and pushed students to develop their boldness and courage in expressing opinions, and teaching in this way helps students in developing some scientific trends and positive behavioral patterns towards Respect others' opinions and listen well.

-The middle school stage (adolescence stage) is considered an important and distinct stage in the student's life, as he urgently needs to enhance confidence in himself, his abilities and feelings, and self-affirmation and character building, so the teenage student needs school activities that provide him with the opportunity to express his skills and abilities

- Motivation has a great importance and a distinct role in the educational process, as learning can only be achieved with the availability and presence of a reason and motivation that contributes to motivating and encouraging the learner towards acquiring knowledge and skills

Conclusions:

1.Adopting an active learning strategy in teaching chemistry increased students' self-confidence.

2.Active learning developed students' sense that they had become the focus of the educational process.

3. Active learning increased students' desire to learn.

4. Active learning creates an atmosphere of joy and happiness and motivates the student to work with longing in order to reach the desired educational goal.

5. The application of active learning achieves intellectual communication and active participation of students during the lesson.

6. The adoption of active learning provides students with a deeper understanding of information.

7.Active learning helps to activate students' memory, information retrieval and application ability

8. Active learning nurtures social relationships among students

9. The two factors of suspense and motivation towards the scientific subject are among the basic factors for increasing educational attainment and the success of the educational process

10.Active learning led to stimulating students' behavior and their drive to pay attention to the educational position

11.Active learning led to improving students' understanding of chemistry and developing their motivation to accomplish classwork

Recommendations:

1. The necessity of adopting an active learning strategy in teaching chemistry to increase students' self-confidence

2. The need to develop students' sense that they are an important focus in the educational process

3. The need to pay attention to the two factors of suspense and motivation towards the scientific material to increase educational attainment and increase degree of success of the educational process the

4.Attention to developing students' achievement and motivation side by side because each of them can serve the other

5.to teach modern Holding training courses for male and female teachers teaching methods at all stages

The proposals:

1. Conducting studies similar to the current study in stages and other materials. 2.Conducting a study to verify the effectiveness of active learning in other variables such as developing thinking skills visual, creative.

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