Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 8, July 2021: 1248-1259

The Impact of Round Robin Strategy on the Acquisition of Chemical Concepts among Fourth-Grade High School Students in Chemistry

Researcher: Nisreen Nemat Ghulam Ali

Ass. Prof. Sama'a Ibrahim Abdullah

ss5rrt5077@gmail.com

Al-Mustansiriya University, College of Basic Education

Article History: Received: 25 June 2021; Revised: 15 July 2021; Accepted: 3 August 2021; Published online: 25 August 2021

Abstract:

The aim of the current research is to identify the impact of annular contest strategy in acquiring chemical concepts for fourth year high school students in chemistry, where the experiment started on Sunday (29/11/2020) and ended on Wednesday (17/2/2021), the research sample was randomly selected from Aden High School for Girls affiliated to the Baghdad Education Directorate / Rusafa First, and the sample size was (36) students, and the experimental design with partial control was chosen, as it was divided into two groups, one of them experimental (A) which included (18) students who studied chemistry with the annular contest strategy, and the control group (B) consisted of (18) female students who studied the same subject in the traditional way, the two research groups were statistically rewarded in some variables (intelligence test, previous achievement, previous information test) as for the behavioral objectives, (198) objectives were formulated for the educational material, which included the chapters (first - second - fifth) of the chemistry book for the fourth grade of high school, the research tool represented by the concept acquisition test was built, the results were statistically treated and showed: the students of the experimental group who studied according to the annular contest strategy outperformed the students of the control group who studied according to the usual method in the test of acquiring chemical concepts.

Keywords: annular contest strategy, acquisition of chemical concept.

Chapter One:Research Introduction

First: Research Problem

The results of previous studies in the specialization of chemistry teaching methods, including the study (Al-Bayati, 2016) (Ibrahim 2016) (Al-Kaabi 2017) confirmed that there is a weakness in the acquisition of chemical concepts and the correct awareness of the scientific concept (chemical) and its connection with other concepts within an integrated knowledge building with weak possession students here, the reasons shown the difficulty of students' understanding of chemical concepts, especially in chapters (first, second, and fifth) of the fourth year book, because they are characterized by abstraction and the weakness of employing their knowledge and applying it in new situations, solving problems, reorganization, fluency, originality, flexibility and conclusion.

Here lies the research problem in answering the question:

- What is the impact of teaching using the annular contest strategy on acquiring chemical concepts for fourth-grade female students of chemistry?

Second: the importance of research

1- Reducing the difficulties that students face in understanding, learning and acquiring chemical concepts, and paying attention to modern teaching trends.
2- This study is an urgent necessity and a strong justification in the light of educational development due to the absence of previous studies that dealt with the impact of annular contest strategy in teaching chemistry for the fourth grade of high school.
3- The contribution of the research in finding a solution to the problem of the low level of achievement for fourth-grade students in chemistry and the acquisition of chemical concepts in a deep way.
4- It could open the way for the use of modern strategies and the development of teaching methods used in our schools.
5- It is possible for teachers of chemistry to benefit from the current research tool represented in the concept acquisition test.

Third: Research Objective: The current research aims to identify the impact of the annular contest strategy on acquiring chemical concepts for the fourth year high school students.

Fourth: Research Hypothesis: There is no statistically significant difference at the level (0.05) between the average scores of the experimental group students who studied according to the annular contest strategy and the average scores of the control group students who studied according to the usual method in the chemical concepts acquisition test.

Fifth: Research Limitations

1- The human limit for fourth-grade high school students in high and secondary schools affiliated with the General Directorate of Education in Baghdad / Al-Rusafa First.
2- Time limit: the first semester of the academic year 2020-2021.
3- Cognitive limit: chapter one, chapter two, chapter five.

From the book of Chemistry for the fourth scientific grade to be taught for the fourth grade of high school, eighth edition, for the year (2017 AD).

Sixth: Define terms

- Annular contest (Ambo Saidi and Huda, 2016) defined it as: "a strategy to clarify alternative perceptions and share ideas and answers to strengthen listening skill with worksheets for each group to record the answers to them" (Ambo Saidi and Huda, 548: 2016).
- Acquisition of concepts defined by (Zayer and Samaa, 2015): "The amount of information that the student acquires when exposed to an educational situation in order to form a behavioral inventory and show its impact on his actions in his daily and practical life." (Zayer and Samaa, 2015: 125)

Chapter Two: Theoretical framework and previous studies

It is one of the cooperative active learning strategies and it is based on the constructivist theory and it is also called (annular succession strategy) or (rotation) its idea can be summarized that the teacher presents one question to each group, and each student must add an answer that complements the answers of his colleagues, and the role returns again on condition without repeating the answers,

this strategy aims to reveal alternative perceptions, share ideas, and strengthen listening skill. (Ambo Saidi and Huda, 548: 2016)

The phases of the annular contest strategy:

A- The stage of seeding ideas without criticism: by asking a problem with multiple solutions or a question with multiple answers in order to get the largest number of answers.

B- The stage of clarifying ideas: where each group leader comes out periodically and presents the solutions of the members of his group to the members of the whole class.

C- The stage of classifying ideas: writing the answers of each group on the board, collecting similar ideas and excluding different ideas.

D- The stage of ideas evaluation: The researcher reinforces the correct ideas by summarizing them on the board, and the student's role ends with building the scientific concept himself and with the help of his colleagues and the teacher. (Ambo Saidi and Huda, 543: 2016)

Characteristics of the annular contest strategy:

1- It is easy and can be easily applied to all school levels and all curricula.

2- Make the student the focus of the educational process and develop his thinking skills.

3- Increases the student's self-confidence in expressing his thoughts and opinions.

4- Achieving interest in each student and respect for opinion and the other opinion. (Kagan, 2009, 27)

The second axis: previous studies

	Researcher, country and year of completion	Study Title	Aim of the study	The study sample	study tool	Statistical means	Results

1	Nabil Ahmed Al-Azzawi 2018 Iraq	the impact of the annular contest strategy on the achievement of fifth graders in the subject of social studies	The impact of the annular contest strategy on the achievement of fifth graders in the subject of social studies	A sample of (63) students divided into two sections (experimental - control).		T_Test, chi-square and Pearson correlation coefficient	The results showed that there were statistical differences in favor of the experimental group in the achievement test
2	Haifa Adnan Maykhan Al-Qara Lucy 2017 Iraq	the impact of the annular contest and hot chair strategies on the achievement of the second intermediate grade students in biology	Knowing the impact of the annular contest and hot chair strategies on the achievement of the second intermediate grade students in biology			Scheffe's method of one-way analysis of variance	There are statistical differences and the students of the first and second experimental groups outperformed the control group in achievement

3	Salem Abdullah Al Sabawi Iraq 2020	the impact of the annular contest strategy in acquiring Islamic concepts for fifth-grade literary students and developing their moral values	Knowing the impact of the annular contest strategy in acquiring Islamic concepts for fifth-grade literary students and developing their moral values		Achievement test	T-Test and Chi-square	There are statistical differences in favor of the experimental group in the concept acquisition test and the moral values scale

Chapter Three: Research Methodology and Procedures

1- **Research methodology:** The researcher followed the experimental method to follow its steps in applying this study because it is appropriate to its subject and depends on careful observation of the phenomenon to be studied represented in identifying the effect of the independent variable on the dependent variables to be measured and practical experience is a source for reaching the most accurate and clear results to reveal the nature of the relationship between the two variables.

2- **Research procedures:** It means the strategy or plan that the researcher will follow to find answers to her questions that occupy him in this research and to find solutions to the problem while ensuring its accuracy, and to overcome the problems and difficulties that he will encounter until the end of the experiment and to control the variation in the degrees of the dependent variable as a result of being affected by the independent variable. (Al-Nahal,123:2016)

The experimental method represents a blueprint for how to conduct the experiment and the most appropriate for the subject of the study, as it takes the experiment as a tool to test a specific hypothesis and observe and explain the variables involved in this hypothesis or event, it also reveals the nature of the relationship between two

variables by studying the opposite situations in which all the variables were controlled, except for the variable to be studied (the dependent variable), as shown in Table (1).(Al-Nouh, 140:2004)

Table (1): Experimental design of the two groups

Groups	Parity	independent variable	post test
Experimental	- Previous collection -Test the previous information - Intelligence -High-ranking thinking	the annular contest strategy	-Concept acquisition test. -High-ranking thinking test.
Control		the usual way	

Second: the research community and its sample

1- **Research community:** the current research community is all female students of high schools affiliated to the General Directorate of Education in Baghdad - Rusafa First, which represents the research community, which amounted to (55) high and secondary schools with (7718) students
2- **Research sample:** The research sample represents a part of the community in which the study is being conducted. It is chosen according to special rules in order to represent the community well. (Mohammed, 64:2011)

division (A,B) was chosen at random, simple, numbering (36) students, and through the lottery, the selection was made on the condition that Division (A) is experimental, which will be studied according to the annular contest strategy with (18) students, and Division (B) is a control group, which will be taught according to the usual method, with a rate of (18) students.

Third: Equality of the two research groups: To overcome the possibility of inequality of the two groups and to ensure the achievement of the internal integrity of the experiment, the researcher was keen to control the following variables:

1- Previous collection.
2- Intelligence.

3- Test the previous information.

Research supplies

1- Defining the scientific material 2- Defining chemical concepts 3- Formulating behavioral objectives 4- Preparing teaching plans.

Sixth: The research tool: In order to achieve the goal of the research and its zero hypotheses, and to measure the effect of the independent variable on the two dependent variables.

1- **Concept acquisition test:** One of the requirements of the current research is to prepare a research sample acquisition test for chemical concepts

According to the three acquisitions of the concept (definition - discrimination - application) and after analyzing the content of the chapter (first - second - fifth) of the chemistry book, it was found that it includes (16) main concepts and (29) secondary concepts, and she prepared the test by following the following steps:

A- Preparing the acquisition test items: The initial formula for the acquisition test represented (48) items compatible with measuring concept operations, defining the concept, distinguishing the concept, applying the concept as an educational product that expresses the measurement of acquisition of chemical concepts.

B- Formulation of test instructions: The test instructions give the learner sufficient information about the type of test, the number of component items, the time allotted for its completion, and how to do it. (Al-Abaji, 2013: 77)

Seventh: Executing the experiment

1- The researcher started the application on the research sample (experimental and control) starting from Sunday (29/11/2020) to Wednesday (17/2/2021) in the first semester with two lessons per week for the two groups (A-B).

The researcher applied the concept acquisition test to the students of the two groups on Sunday, February 14, 2021, then corrected the answers and obtained the test scores for the two research groups.

Eighth: Statistical Means: The results were analyzed and processed statistically using appropriate statistical means.

Chapter Four: Presentation and interpretation of the results

The chapter includes a presentation of the research results in light of the research objective and its null hypotheses and the interpretation of those results, conclusions and suggestions reached by the researcher:

First: Presentation of the results: After the researcher relied on the results of the test of the two dimensional variables, it was found that the students of the experimental group were superior to the students of the control group in the test of acquiring chemical concepts, where the arithmetic mean and variance of the scores of the experimental group were (26.66) and (20.77), respectively, which is higher than the arithmetic mean of the scores the control group (20.38) and (17.44)

By using the t-test for the two independent research samples of equal number, the calculated t-value was found and its value is (4.65), which is greater than the tabular t-value (2) at the significance level (0.05) and the degree of freedom (34), and therefore the first null hypothesis is rejected, and the alternative hypothesis which states that there is a statistically significant difference at the level (0.05) between the average scores of the experimental group students who studied according to the annular contest strategy and the average scores of the control group students who studied according to the usual method.

Table (2) The arithmetic mean, variance and T-value of the scores of the experimental and control groups in the concept acquisition test

the group	The number of students in the sample	the arithmetic mean	variance	degree of freedom	T- value		Statistical significance at the 0.05. level
					Calculation	Tabular	
Experimental	18	26.66	14.23		4.65	2	Statistical function
Control	18	20.38	12.72	34			

Second: Interpretation of the results

Interpretation of the results related to the first null hypothesis (concept acquisition):

1- Teaching according to the annular contest strategy helps to attract the attention of the students and increases their focus on defining the concept, distinguishing it and applying it more, which gives a great meaning to the concepts because learning by meaning increases the level of their acquisition and thinking and the annular contest strategy is one of the modern teaching methods that have never been used before, which increased the acquisition of chemical concepts.
2- The use of the steps of the annular contest strategy has increased the students' interest in it and made them more effective in the classroom.
3- The annular contest strategy increases the students' ability to build their knowledge while they perform many tasks on their own, making their learning based on understanding.
4- The annular contest strategy is one of the strategies that arouse the interest of students and emphasizes attention, focus and observation.

Conclusions: In light of the results of the current research, the researcher reached:

1- Teaching chemistry using the annular contest strategy was more effective for female students than teaching in the usual way.
2- The use of the annular contest strategy led to positive results in acquiring chemical concepts for fourth-grade students.
3- The annular contest strategy made the student the focus of the educational process, which helped the positive interaction between the students and active participation throughout the lesson.
4- Make the students active participants in the lesson and focus more on the questions that arise during the lesson, discussion, inquiry, searching for solutions and eliciting the most creative ideas.

Recommendations: In light of the results of the current research, the researcher recommends the following:

1- Emphasis on the necessity of teaching the annular contest strategy in chemistry for high schools due to its effectiveness in acquiring chemical concepts.

2- Training teachers of chemistry on how to use modern models, methods and strategies in teaching, especially those based on the principles of constructivist theory and moving away from the traditional method of teaching.
3- Preparing classrooms and classrooms with educational devices and aids to provide the opportunity for teachers of scientific subjects to teach using modern and diverse strategies.

Suggestions:

To complement and develop this research, the researcher suggests conducting studies as follows:

1- Conducting a study to identify the effectiveness of the annular contest strategy in the achievement of fourth-grade students and the development of thinking skills of different types.
2- Work on conducting a study to identify the effectiveness of the annular contest strategy in acquiring concepts for another subject.
3- Conducting a study to identify the effectiveness of the annular contest strategy in the achievement of fourth grade students in science related to other variables such as their cognitive and skill retention.
4- Conducting another similar study on different stages of study and other study subjects.

Sources:

1. Ibrahim, Maha Sami, (2016): "The impact of teaching using a mathematical syntax strategy on the acquisition of chemical concepts by fourth grade students and developing their analytical thinking skills", College of Basic Education - Al-Mustansiriya University.
2. Ambo Saidi, Abdullah bin Khamis and Huda bint Ali Al-Hussainiya, (2016): "180 active learning strategies with practical examples", Dar Al Masirah for Publishing, Distribution and Printing, Amman - Jordan.
3. Al-Bayati, Havana Rafe', (2016): "The impact of teaching with the stepanz model on the achievement of fourth-grade students in science in chemistry and their analytical thinking", College of Basic Education - Al-Mustansiriya University.

4. Zayer, Saad Ali and Samaa Turki Dakhil, (2015): "Modern Trends in Teaching Arabic", Dar Al-Murtadha for Printing, Publishing and Distribution, Iraq - Baghdad - Al-Mutanabi Street.
5. Al-Abaji, Omar Muwaffaq Bashir, (2013): "The impact of using the diagnostic-remedial teaching strategy in modifying the misunderstanding of mathematical concepts among second-grade students and developing their motivation towards learning mathematics", an unpublished master's thesis, University of Mosul, College of Basic Education.
6. Al-Kaabi, Muhammad Rahima, (2017): "The effectiveness of the 4mat strategy in the acquisition of second-intermediate students of chemical concepts and high-ranking thinking", College of Basic Education, Al-Mustansiriya University.
7. Matsvange, M., Mugomba, J. ., Sithole, S. ., &Murumbi, A. . (2021). Early Childhood Development Trainee Teachers' Perceptions on E-learning Implementation during the COVID-19 era in Harare Metropolitan District, Zimbabwe. Middle Eastern Journal of Research in Education and Social Sciences, 2(3), 97-110. https://doi.org/10.47631/mejress.v2i3.301
8. Mohamed, Abdel-Ghani, (2011): "Emotional and Social Intelligence", Performance and Development Center, Cairo.
9. Al-Nahal, Suhad Fakhri Adel, (2016): "The impact of employing the numbered heads strategy on developing communication skills and achievement motivation in mathematics among seventh grade students in Gaza", College of the Islamic University, Gaza.
10. Kandil, B. (2021). The Stem of Meaningful Learning. Middle Eastern Journal of Research in Education and Social Sciences, 2(3), 15-24. https://doi.org/10.47631/mejress.v2i3.268
11. Al-Nouh, Musaed bin Abdullah, (2004): "Principles of Educational Research", 1st Edition, Saudi Arabia.
12. Kagan,S., and Kagan,M ,(2009): Kagan cooperative learning .San Clemente,CA: Kagan Publishing.