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Impact of Bubbles Map strategy on developing science operations' skills for 5th grade literary students in the subject of rhetoric and application

[1]Ass. Prof. Ahmed Fleeh Hassan; [2] Prof. Dr. Sondos Abdul Qadir Aziz Al-Khalidi;
[3]Haider Majeed Hammadi

Abstract
This research aims to know the effect of the strategy of map bubbles on developing the skills of science operations among 5th grade literary students in the subject of rhetoric and application, and the design of the experimental and control groups with the pre and post-tests was used. The research sample consisted of (50) students divided into two groups, an experimental group of which reached the number of its members is (25) students and studied using the strategy of map bubbles, and a control group of its members reached (25) students and studied in the traditional (standard) method. The researchers prepared a multiple-choice achievement test with several (30) paragraphs, and its validity and consistency were extracted. Then the test was applied to the sample before and after, and the actual results reached by the research: There is a statistically significant difference between the mean scores of the experimental group who study the rhetoric and application subject using the bubble map in the pre and post-tests in developing the skills of science operations as a whole, and there is no statistically significant difference between The average scores of the control group students who study rhetoric and application in the traditional (standard) method in the pre and post-test in developing the skills of the science processes as a whole, and finally, there is a statistically significant difference between the average scores of the students of the experimental group who are studying rhetoric and application using the map of bubbles and the average scores of the students of the traditional (standard) control group in the post-test in developing the skills of science operations as a whole.
Keywords: *strategy, bubble map, science operations skills, Grade V literary, rhetoric.*

Introduction
The Arabic language is integrated with all its branches, in reading, expression, literature, texts, grammar, criticism, and rhetoric; it is an integrated unit. Rhetoric is a literary art as it provides many foundations that should be taken into account when producing a literary work, thus enabling the reader to taste and distinguish literary work. It helps the learner to taste and enjoy literature, expand his artistic horizon and literary imagination, refine his sense and refine his conscience, so he tastes beauty and realizes the areas of creativity and beauty in it (Al-Jubouri and Hamza, 2013). Thus, students in the preparatory stage realize that rhetoric is not concerned with laws only as much as it is concerned with the colors of literary expression that is appealing to taste and which the human soul is inclined to. Several rhetorics, but it is measured by the extent of their skills and abilities in finding rhetorical purposes in the various literary texts (Al-Dulaimi and Souad, 2005). The importance of teaching strategies appears in the learning process and the role they can play in upgrading students 'abilities, exploring their potential, developing their thinking capabilities, and developing their readiness for creativity and innovation (Al-Suroor, 1996). Therefore, we needed to develop the skills that the learner possesses to be able to solve questions through Experimenting with modern strategies and for active learning several strategies, including the Bubbles Map, which aims to develop evaluation thinking. The bubble map is used in: developing evaluation thinking, providing descriptive details of things, and developing the student's ability to identify traits and characteristics in words or symbols (Hyerle, David, 1996). These strategies are closely related to the science processes whose importance stems in developing the abstract thinking capabilities of students (Padilla, 1980). Educators emphasized on teaching science operations to students and the importance of teaching it in all educational stages because science operations are mental skills that the learner uses in collecting data and analyzing them to solve problems in order to formulate responses to questions, justify views, and interpret events and results. Science processes develop creative talents, so if the student is allowed to work and research on his own, record his observations, measure, classify, conclude, forecast, and set hypotheses, these activities require the application of essential and integrated science processes, as they put the student in the position of the explorer, so that he becomes an active participant in inquiry learning—moreover, discovery and then

[1] University of Baghdad / College of Administration and Economics
[2]University of Baghdad / College of Education for Women
[3] Maysan University / College of Basic Education

developing his talents and creative abilities (Zaitoun, 2004). From the above, the importance of the research is evidenced by the following: The importance of the Arabic language as the language of the Noble Qur'an and the importance of the strategy of the Bubbles Map in the rhetoric subject, as it is one of the modern strategies that focus on the student's role towards learning.

Literature review

1- Strategy

(**Schunk, 2000)** defined it as plans directed to perform tasks in productive ways and systematic production to reduce the level of dispersion between the current knowledge of the learner and the goals he wishes to achieve. While (Shehata, 2003), it was described as a collection of methods and practices that the classroom professor followed to produce results.

2- Bubble map

(**Podded, 2017**) Defined it as: "Map of a central circle and several circles around, writes in the central circle the word or thing you want to describe or identify qualities and characteristics, and writes in foreign circles the essential qualities or characteristics of the Walsh esophagus or the word and definition of procedural her It is a set of procedures adopted by researchers to help 5th grade literary students to prepare some circles in which the typical characteristics of two concepts (analogies) are written when balancing between them, and on the side of the two circles from the outside, the different characteristics of the two concepts (differences) are written when balancing between them, and those concepts are related to topics. Rhetoric and application book.

3- Development

It is the amount of improvement achieved by the 5th grade literary students (the research sample) in developing the skills of science operations.

4- Skill

(**Allagany, 2003**) Defined it as: "Easy performance flour, based on the understanding or comprehension of what you learn learner physically and mentally with the availability of time, effort and costs " and known (**Nile, 2006**) as "performance which is characterized by understanding in the shortest possible time, and less effort The result of practicing and training systematically, and the procedural definition of the skill is the ability of the 5th grade literary students (the research sample) to perform a job with a high degree of perfection and with the least possible time and effort, whether theoretical or practical.

5- Science process

(**Hussein, 2004**) Defined it as: " a range of activities, skills and mental processes used by individuals and scientists to solve scientific problems and study natural phenomena, in order to interpret and access to scientific knowledge" as defined by the (**Howeidi, 2005**) as: "teaching methods, measurement, problem-solving and use Ideas, which describe the patterns of thinking and logical trial required, and the procedural definition is that it is several skills to be developed by female students in the subject of rhetoric and application, which are measured procedurally by the performance of 5th grade literary students (the research sample) on the science operations test prepared by the researcher and N.

6- Rhetoric

(Antioch, 2000) described as "attaching the speaker to imply the end of it is legal properties of frameworks correct" as specified by (Tahir, 2010) that: performing Galilee sense is true words fluent in themselves-enchanted by the suitability of any single term from the house, stated to the people who claim the operational concept are a series of subjects (Tahir, 2000).

Methodology

1- *The research problem*

The goal of the lessons in high- and middle schools is to realize the noble ideas and meanings of the literary texts, and this requires that the rhetorical lesson is enjoyable, not focused on reciting norms, on memorizing rules and to learn them in a theoretical way, which fails to achieve the purpose of esthetic use in the language. Drainage is a dry matter without all artistic beauty (Yunus, 1977). Students 'weakness in rhetoric can be attributed to several reasons, including Teachers' adoption of traditional methods based on memorization and indoctrination in presenting the subject matter to students. Therefore, a number of those interested in the Arabic language and its methods of teaching suggested transferring the rhetorical lesson from vague definitions to practical and technical applications by researching modern methods, strategies, and models aimed at teaching discourse in light of literary texts, whether they are poetic. Or in prose (Zahir, 2010). the requires a teacher who is familiar with modern teaching methods, strategies, and models, and can use them in a way that helps him create the appropriate educational environment for the application in order to transfer knowledge from the unknown to the known and to raise the scientific level of students to overcome the difficulties of the material (Al-Hailah & Tawfiq, 2002). Therefore, the researchers identified the problem of the current research in answering the following question: Does the map of bubbles help to develop the scientific operations skills of literary 5th grade students balanced in the traditional (standard) way?

2- *Research assumptions*

To achieve this goal, the researchers put the following null hypotheses:

a- There is no statistically significant difference at the level of (0.05) between the average scores of the students of the experimental group who are studying the rhetoric and application of the Bubbles Map strategy in the pre and post-tests in developing the skills of science operations as a whole.
b- There is no statistically significant difference at the level of (0.05) between the average scores of the control group students who study rhetoric and application in the traditional (standard) method in the pre and post-tests in developing the skills of science operations as a whole.
c- There is no statistically significant difference at the level of (0.05) between the average scores of the students of the experimental group who study the rhetoric and application subject with the strategy of the map of bubbles and the average scores of the students of the control group who study the same subject in the traditional (standard) method in the post-test in developing skills of science operations as a whole.

3- Research methodology and procedures

This section includes a description of the procedures used in this research:

First: The experimental design of the research: The study protocol accepted includes a practical laboratory design to satisfy the study's purpose and hypotheses. Researchers feel it possible to construct trial and control groups for the two pre and post-tests, so they consist of two equivalent classes; this is shown in Figure (1).

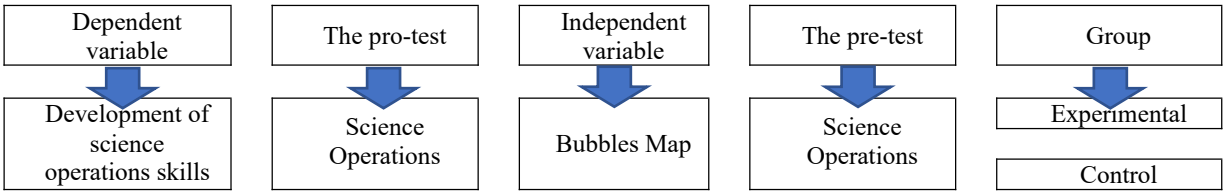

Figure (1) Experimental Design for Research

The experimental group refers to a group whose students use the map of bubbles to study rhetoric. The reviewing party: is a community whose students investigate the theoretical topic in the conventional (standard) approach and pre-testing process: it examines the scientific processes to which the two research classes are subjected (experimental and control). It aims at constructing science activity abilities. The dependent variable was tested by the empirical organizational test to detect the impact.

Second: Research community and its sample:

The current research requires choosing one of the secondary schools in the city of Baghdad, provided that the number of 5th grade literary divisions in it is not less than two divisions. Al-Zuhoor Girls High School, affiliated to the General Directorate of Education Baghdad/ Al-Karkh II, was chosen to experiment with it. It was intentionally chosen to apply the research experiment because of the convergence of the school students in terms of the social, economic, and cultural brackets, and the school includes two divisions for the fifth literary class. By the random draw method, the researchers chose Division (B) to represent the experimental group that will study the rhetoric subject using the map of bubbles, and Division (A) represented the control group that will study the rhetoric subject in the traditional (standard) method. The number of female students in the two divisions was (54) students, of which (27) were students in each division, and after excluding the female students who were only four students for each division, the final sample number became (50) students, of which (25) students were in the experimental group, and (25) A student in the control group, and Table (1) illustrates that.

Table (1) Number of female students in the experimental and control research groups before and after exclusion

Group	Division	The number of female students before exclusion	The number of female students who have failed	The number of students after exclusion
Experimental	B	27	2	25
Experimental	A	27	2	25
Total		54	4	50

Third: The two research groups are equivalent

Before starting the experiment, the researchers were keen to statistically equalize the students of the two research groups in some of the variables that they think may affect the safety of the experiment, and these variables are:

a- **The students' chronological age is measured in months**: The arithmetical means of the study community surpassed (199,200) months, while the control group achieved the arithmetical norm (196,320) months. If the (computed T) value (0.869) is smaller than the Tabular (T-value) and the degree of freedom (48) were determined, it reveals that all study classes are statistically equal for the historical period, and Table (2) illustrates that.

Table (2) the equivalence of the students of the two research groups in the chronological age, calculated in months, using the T-test for two independent samples

Group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T Value		Sig. level 0.05
						computed	tabular	

Experimental	25	199.200	12.000	144	48	0.869	2.001	Not Sig.
Control	25	196,320	11.426	130.55				

b- The grades of female students in the final Arabic language subject for the previous academic year (2019-2020) for the fourth literary grade: The numerical average of the effects of the experimental was (70.72), the arithmetical average of the controls was (68.04). By using (T-Test) two independent tests, it became apparent that the discrepancy at the stage of (0.05) was not statistically significant because the calculated (T-value) (0.9449) was lower than the T-value of the Tabular (T-value) (2.001) and with independence (48). This suggests that both research groups are statistically equivalent to the current academic year in the Arabic language, as shown in Table (3).

Table (3) Results of the T-test for students of the two groups of research in the Arabic language in the final examination for the academic year 2018-2019

Group	No. of the sample	$\bar{X}$	SD	variance	Degree of freedom	T Value		Significance level 0.05
						computed	tabular	
Experimental	25	70.72	10.000	100	48	0.9449	2.001	It is not a statistical indication
Control	25	68,04	9.97	99.40				

c- **Pre-test scores for science operations**: Before the start of the experiment, the researchers applied the pre-test for science operations on the students of the two research groups, as the average scores of the experimental group students in the observation were (3.160), while the mean of the scores of the control group members was (3.00). By using (T-Test), it became clear that the difference was not statistically significant at the level of significance (0.05), as the calculated value (0.582) was smaller than the Tabular (T-value) (2.001) and with a degree of freedom (48). In contrast, the average scores of the experimental group members for the classification skill (2,600) score, as for the average grades of the control group for the classification skill (2,400), and by using (T-test), it became clear that the difference was not statistically significant at the level of significance (0.05) as the calculated (T-value) (0.693) was smaller than the Tabular (T-value) is (2.001), and with (48) degrees of freedom and an average number of experimental community participants for the deduction capabilities are (2.720) degrees as with the average number of participants of the control group for the deduction ability (2.680), and with (T-test) it became apparent that the discrepancy was not statistically significant at the significance stage (0.05), regardless of the estimation of the deduction capacity, in comparison, the average scores of the experimental group members for the inference skill were (3.960) degrees. The average scores of the control group members were (3,840) degrees. By using (T-test), it became clear that the difference was not statistically significant at the level of significance (0.05), as the calculated (T-value) (0.341) was smaller than the Tabular (T-value) (2.001) and with a degree of freedom (48). The average total of the scores of the experimental group members was (12,440) degrees, while the average total of the scores of the control group members was (12,000) degrees. By using (t-test) for two independent samples to find the significance of the statistical differences, it became clear that the difference was not statistically significant at the level of significance (0.05), as the calculated (T-value) (0.786) was smaller than the tabular value (2.001), and with a degree of freedom (48). It indicates that the two research groups are statistically equivalent in this variable. Table (4) shows that.

Table (4) Equivalence of the female students of the two research groups in the pre-test of the skills of science operations using the T-test for two independent samples

Group	Skills	Sample Number	$\bar{X}$	SD	variance	D.F.	T Value		Sig. level 0.05
							computed	tabular	
Exper.	Observation	25	3.160	0.800	0.64	48	0.582	2.001	Not sig.
Cont.		25	3.000	1.118	1.250				
Exper.	Classificatio n	25	2.600	1.000	1	48	0.693	2.001	Not sig.
Cont.		25	2.400	1.041	1.084				
Exper.	Conclusion	25	2.720	0.980	0.960	48	0.154	2.001	Not sig.
Cont.		25	2.680	0.852	0.726				
Exper.	deduction	25	3.960	1.274	1.623	48	0.341	2.001	Not sig.
Cont.		25	3.840	1.214	1.473				
Exper.	Total	25	12.440	1.7097	2.923	48	0.786	2.001	Not sig.
Cont.		25	12.000	2.217	4.915				

d- **Academic achievement by parents**: It appears from Table (5) that in the iterations of academic achievement, the two research groups are statistically equivalent since the data results were shown using the Chi-square, the calculated value of (Chi-square) (0.582) is lower than the value of the chi-square tabular (5.99) at the level of significance (0.05) with a degree of freedom (2).

Table (5) Frequencies of academic achievement for the parents of the two research groups and the calculated and tabular chi-square value

Group	Sample Size	Elementary	intermediate	Secondary	Institute	University and above	D.F	T Value		Sig. level 0.05
								Calc.	Tab.	
Exper.	25	2	3	5	7	8	2	0.582	5.99	Not sig.
Cont.	25	2	4	6	5	8				

(*) The two cells (Elementary with intermediate) were merged into one cell because the expected frequencies were less than (5), so the degree of freedom became (2).

e- **Mothers 'academic achievement**: It emerges from Table (6) that the two study classes are statistically equal in the iterations of academic achievement; if the findings of the analysis occurred using the chi-square, the measured chi-square value (0.8) is lower than the chi-square tabular value (5.99) at a sense standard (0.05) and a degree of freedom (2).

Table (6) Frequencies of academic achievement of the mothers of students of the two research groups and the chi-square value calculated and tabular

Group	Sample Size	Elementary	intermediate	Secondary	Institute	University and above	D.F.	T Value		Sig. level 0.05
								Calc.	Tab.	
Exp.	25	3	4	5	5	8	2	0.486	5.99	Not sig.
Cont.	25	2	5	5	6	7				

F- **Test the linguistic ability of the stranger's symbolism**: Before beginning the experiment, the researchers administered the linguistic ability test (preparing the meaning of the stranger-part five for comprehension of the linguistic symbols) to the students of the two research groups, as the average scores of the experimental group students surpassed (12.520) and the average scores of the students in the control group were (12.480) and when using the experimental group. Additionally, as shown in Table (7).

Table (7) the results of the T-test for the language ability test scores of the students of the two research groups

Group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T Value		Sig. level 0.05
						Calc.	Tab.	
Experimental	25	12.520	1.475	2.176	48	0.095	2.001	Not sig.
Control	25	12,480	1.503	2.259				

Prepare test instructions

The researchers set the following instructions:

a- Answer instructions: Write your name and your division in the space provided for them on the answer sheet; In front of you, a test consists of several paragraphs, all of which are required to be answered without leaving any paragraph.

b- Correction Instructions: One score is assigned to the paragraph whose answer is correct, and zero to the paragraph whose answer is wrong. The abandoned paragraph or that carries more than one answer is treated as the wrong paragraph, and the maximum score the student gets is (30) degrees.

4- A research tool

a- Prepare a list of specific scientific competencies: The researchers decided to prepare a list of specific science operations skills, intending to build a test for them, in the form of a questionnaire with a graded scale with four graded levels (very large, large, medium, and weak). Then the questionnaire was presented in its initial form to (15) specialists in education, psychology, and methods of teaching the Arabic language. The difference between the responses of the respondents and the responses of the non-agree to all the skills included in the list was used (chi-square). The results showed that (6) six of the skills are not statistically significant, and (4) four of the skills, the difference between them was a statistically significant that was preserved Table (8). Thus, the list in its final form became valid for determining the specific science operations skills of the research sample.

Table (8) the percentage and chi-square value of experts' agreement on the list of specific science operations skills

Rank	Basic science operations skills subject to measurement	No. of opponents	No. of concurrent	%	Chi-square	Sig. level 0.05
1	Observation	-	15	100	15	Sig.
2	Measurement	5	10	67,66	2,4	Not sig.
3	Classification	-	15	100	15	Sig.
4	Conclusion	-	15	100	15	Sig.
5	induction	5	10	67,66	2,4	Not sig.

6	deduction	1	14	33,93	11,27	Sig.
7	Forecasting	5	10	67,66	2,4	Not sig.
8	Use of numbers	5	10	67,66	2,4	Not sig.
9	The use of spatial and temporal relationships	5	10	67,66	2,4	Not sig.
10	Connection	5	10	67,66	2,4	Not sig.

* The tabular value of chi-square at the level of significance (0.05) with a degree of freedom (1) is (3.14)

b- Build science operations test: The researchers proposed to prepare questions for basic science operations skills from the four topics. One of the types of objective tests was chosen, which is a multiple choice because of its validity and consistency and corrects far from the subjectivity of the corrector, and it measures many learning outcomes (Muhammad, 1999). The number of items of the science operations test was determined to (30) items of the multiple-choice type and with four alternatives. The position of the correct answer was distributed randomly between the test items, and the relative weight was determined for each skill of the basic science operations skills Table (9).

Table (9) specifications for basic science operations

topic	Dimensions of science operations and their relative weight								No. of test items	
	Observation		Classification		Conclusion		deduction			
	No of questions	%	No of questions	%	No of questions	%	No of questions	%	No of questions	%
Assonance	2	6.67	1	3.33	3	10	1	3.33	7	23.33
Alliteration	1	3.33	1	3.33	4	13.33	2	6.67	8	26.67
Counterpoint & interview	2	6.67	1	3.33	2	6.67	2	6.67	7	23.33
Pun	1	3.33	1	3.33	3.33	10	3	10	8	26.67
Total	6	20	4	13.33	12	40	8	26.67	30	100

5-Research limits:

The current search is determined by:

a- One of the secondary day schools for girls in Baghdad governorate, affiliated to the General Directorate of Education in Baghdad / Al-Karkh II.

b- A sample of 5th grade literary students from this school for the 2019/2020 academic year.

c- The first semester of the academic year 2019/2020.

d- Some of the topics in the book of rhetoric and application for the fifth grade literary to be taught for the academic year 2019/2020, which are (assonance, alliteration, contiguity and interview, puns).

6- Validity of the Test

In order to verify the validity of the test, the researchers introduced their initial formulation of (30) paragraphs to a variety of Arabic-specific experts and their methods of teaching and educating Arabic-speaking teachers and their students to discuss their views on the appropriateness of the material to the goals of the test and the basic science skills in question, and asked them to provide them with the necessary information. Initially, a proportion (80 percent) of specialists were allowed to consider the test items, so the test items were retained because they had more than (80 percent).

7- Stability of the analysis

The equation (Scott's) has been used to test the accuracy of the researcher's analysis with other researchers repeatedly (Scott, 1968). A selection of the science processes present in the questions examined was chosen with a percentage (50 percent) of the total number of operations in the Table (10) to determine the coefficient of agreement. The period between the first researcher's analysis and the second one's analysis was (14-21) (Adams, 1959), as shown in Table (10).

Table (10) reliability of the analysis

Type of agreement	procedures	Agreement coefficient
Agreement between analysts	Between the researcher and the first analyst	0.84
	Between the researcher and the second analyst	0.87
Agreement over period	Between the researcher and herself with an interval of (14-21) days	0.90

Exploratory application of the test:

The test was applied to an exploratory sample that reflects approximately the sample of research, collected by researchers from the same testing group, and has the same criteria for the sample. It consisted of (150) 5th grade literature students at a girls' high school on Wednesday 11/11/2019, and after submitting the question, it became evident that the time taken to address all the question items was about (45-55) minutes, and after measuring the average time, it was noticed that it was (50) minutes to complete the reaction.

Statistical analysis of the test items:

The purpose of analyzing the test items is to select the answers of the individuals for each of the test items, this process includes detecting the difficulty level of each of the test items, the strength of their distinction, and the effectiveness of incorrect alternatives in the multiple-choice items. (Al-Zobaie, 1981) In order to analyze the test items, the scores of the survey sample students were arranged in descending order after correcting the answers, then selected the highest and lowest (27 percent) of them as the best balance ratio for the study of the characteristics of the test items between two disparate groups from the total. (82) Students were classified as female students in both the upper and lower classes. With an average of (41) students in each group, then the following depends on the level of complexity, the frequency of prejudice, and the usefulness of incorrect alternatives in the objects of multiple choice:

a- The level of difficulty of the paragraph: the difficulty factor of each of the test items was calculated and found between (0.55) and (0.72).

b- The strength of discrimination of the paragraphs: The discriminatory strength of each paragraph of the test was calculated, and it was found between (0.33) and (0.52).

c- The effectiveness of the wrong alternatives: The effectiveness of the wrong alternatives was calculated, and it was found that the wrong alternatives ranged between (-0.12, -0.22).

Stability:

The test is considered stable if we obtain the same results when re-applying it to individuals themselves under the same circumstances (Al-Gharib, 1977). The method of (K.R.20) was used to extract stability. The value of the stability coefficient for testing science operations was (0.77), which is a good correlation coefficient.

A final picture of the test:

After completing the procedures and statistics related to the test and its paragraphs, the test became in its final form consisting of (30) items of the multiple-choice type.

Experience application:

During the application of the experiment, the researcher followed the following:

a- I started applying the experiment to the students of the experimental and control research groups on Tuesday, 10/15/2019, and taught two lessons per week for each group, and the teaching continued until Wednesday, 20/11/2019.

b- The beginning of the experiment and before the start of the mental teaching of the students of the experimental and control groups with the method of teaching for each group is explained.

c- The experimental and control research groups studied themselves according to the teaching plans prepared by them.

d- The science operations skills test was applied to the students of the experimental and control research groups simultaneously on Wednesday, 20/11/2019, and at 8:30 a.m. for measuring the skills of science operations.

Results

This section includes a presentation of the findings of the research. Its interpretation and the level of significance (0.05) was determined to test the significance of the differences between the averages of the experimental and control groups of the research hypotheses to know the effect of the independent variable (the bubble map) on the dependent variable (skills of science operations).

First: Presentation of results: The results are presented in the following hypotheses of research:

1- The first hypothesis

There is no statistically significant difference at the level of (0.05) between the mean scores of the students of the experimental group who are studying rhetoric and application using the bubble map in the pre and post-tests in developing the skills of science operations as a whole. The review of findings showed the average scores of experimental students in the research community were (23,280) while the numerical average scores of post-test students were (11,200) and, by using (T-test) for two tests, the T value of (18,456) was determined at the significance level (0.05) and grade level (456,18)

Table (11) Net results of test scores for students in the experimental group pre and post-tests the skills of science processes

Experimental group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T-value		Sig. at level 0.05
						Calc.	Tab.	
pre	25	23.280	2.807	7.879	24	18.456	2.064	Sig.
post		11.200	1.683	2.833				

Table (11) displays the effects of ratios, standard deviations, (T-test) values and their degree of statistical meaning from the pre and post-tests of the evaluation of measuring skills in research operations as a whole and its sub-skills.

Table (12) the results of the T-test in the pre and post applications to test the science processes as a whole and its sub-skills for the experimental group students

Skills	Experimental group	The number of the sample	$\bar{X}$	SD	variance	D.F.	T-value		sig. is at 0.05 level
							Calc.	Tab.	
Observation	post	25	4,680	0,900	0,81	24	6,311	2,064	Sig.
	pre		3,160	0,800	0,64				
Category	post	25	3,680	0,476	0,227	24	4,876	2,064	Sig.
	pre		2,600	0,1000	0,01				
Conclusion	post	25	9,680	1,345	1,809	24	20,91	2,064	Sig.
	pre		2,720	0,980	0,960				
Deduction	post	25	5,240	0,879	0,773	24	134,4	2,064	Sig.
	pre		3,960	1,274	1,623				
Science operations as a whole	post	25	23,280	2,807	7,879	24	18,456	2,064	Sig.
	pre		11,200	1,683	2,833				

By extrapolating the results mentioned in Table (12), the following becomes clear:

a- *Observation skill*: From the table (2), it is evident that the mean in the post-test group scores was (4,680) degrees, the mean in the pre-tested group was (3,160), and the (T Calculate) value was (6,311), which is higher than the (T tabular) value of (2,064) at the level of significance (0,05) and the free degree.

b- *Classification skill*: It is clear from Table (2) that the mean of the scores of the experimental group members in the post test is (3.680) degrees, while the mean of the scores of the experimental group members in the pre-test was (2.600) degrees, and (T-computed) value is (4,876), it is greater than the (T-tabular) value of (2,064) at the level of significance (0.05) and with the degree of freedom (24).

c- *Reasoning skill*: It is clear from Table (2) that the mean of the scores of the experimental group members in the post-test is (9.680) degrees, while the mean of the scores of the experimental group members in the pre-test was (720.2) degrees, and the (T) value was The computed (20.91) is greater than the (tabular T) value of (2,064) at the level of significance (0.05) and with the degree of freedom (24).

d- *Deduction skill*: It is evident from Table (2) that the mean of the scores of the experimental group members in the post test is (5.240) degrees, while the mean of the scores of the experimental group members in the pre-test was (3.690) degrees, and the value T reached The computed (4,134) is greater than the (tabular T) value of (2.064) at the level of significance (0.05) and with the degree of freedom (24).

2- The second hypothesis

"There is no statistically meaningful gap at the stage of (0.05) between the average scores of the control group students who research rhetoric and implementation in the pre- and post-tests conventional (standard) approach to improve the skills of the science operations as a whole".

After an analysis of the results, we found that the average scores of control group students for the post-tests were (12,920) while the arithmetical mean of control group scores for the pre-test was (12,240) and when two correlated samples (T-test) were used to determine the meaning of the statistical difference between the two averages. A statistically significant discrepancy emerged when the calculated (T-value) of (1.148), at sense level (0.05), and with a freedom degree (24) less than the Tabular (T-value) (2.064). Hence, Table (13) shows that you are embracing a second hypothesis.

Table (13) Results of the t-test for the scores of the control group students in the pre & post-tests for the skills of science operations as a whole

Experimental group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T-value		Sig. at level 0.05
						Calc.	Tab.	
pre	25	12.920	2.067	4.273	24	1.148	2.064	Not Sig.
post		12.240	2.119	4.490				

While Table (14) shows the results of averages, standard deviations, and (T-test) values and their level of statistical significance from the pre and post applications of the test measuring skills of science operations as a whole and the following sub-skills:

Table (14) the results of the (T-test) in the pre & post applications to test the science operations and its sub-skills for the control group students

Skills	Experimental group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T-value		sig. at level 0.05
							Calc.	Tab.	
Observation	post	25	3,240	1,052	1,107	24	0,782	2,064	Not Sig.
	pre		3,00	1,118	1,249				
Category	post	25	2,560	1,003	1,006	24	0,553	2,064	Not Sig.
	pre		2,400	1,041	1,084				
Conclusion	post	25	2,920	1,077	1,159	24	0,874	2,064	Not Sig.
	pre		2,681	0,528	0,725				
Deduction	post	25	4,280	1,242	1,543	24	1,267	2,064	Not Sig.
	pre		3,840	1,214	1,474				
Science operations as a whole	post	25	12,920	2,067	4,273	24	1,148	2,064	Not Sig.
	pre		12,240	2,12	4,494				

By extrapolating the results mentioned in Table (4), the following becomes clear:

a- *Observation skill*: It is clear from the table that the mean of the scores of the control group members in the post-test (3,240) A score, while the mean of the scores of the control group members in the pretest was (3.00) a score, and the calculated (T-value) was (0.782) which is less than the Tabular (T-value) of (2.064) at the significance level (0.05) and with a degree of freedom (24).

b- *Classification skill*: It is clear from the table that the mean of the scores of the control group members in the post-test (2.560) A score, while the mean of the scores of the control group members in the pretest (2,400) A degree, and the calculated (T-value) is (0.553) which is less than the Tabular (T-value) of (2,064) at the significance level (0.05) and with a degree of freedom (24).

c- *Reasoning skill*: It is clear from the table that the mean of the scores of the control group members in the post-test (2.920) A score, while the mean of the scores of the control group in the pretest was (2. 681) A degree, and the calculated (T-value) is (0.874) which is less than the Tabular (T-value) of (2.064) at the significance level (0.05) and with a degree of freedom (24).

d- *Deduction skill*: It is clear from the table that the mean of the scores of the control group members in the post-test (4.280) A score, while the mean of the scores of the control group members in the pretest was (3,840), and the calculated (T-value) was (1.276), and it is less than the Tabular (T-value) of (2.064) at the significance level (0.05) and with a degree of freedom (24).

3- The third hypothesis

There is no statistically significant difference at the level of (0.05) between the average scores of the students of the experimental group who study the rhetoric and application subject using the map of bubbles and the average scores of the students of the control group who study the same subject in the traditional (standard) method in the post-test in developing the skills of science operations as a whole. To verify this hypothesis, a (T-test) was used for two independent samples. Table (15) shows that the mean of the scores of the experimental group members is (23,280) degrees, while the mean of the scores of the control group members is (12,920) degrees, and the calculated (T-value) is (14.728), which is greater than the tabular (T-test) of (2.001) at the level of significance (0.05) and with a degree of freedom (48). Thus, the third hypothesis is rejected.

Table (15) the results of the t-test for the grades of the two groups of experimental and control research students for the post-test for science processes as a whole

Group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T-value		sig. at level 0.05
						Calc.	Tab.	
Experimental	25	23.280	2.807	7.879	48	14,728	2,001	Sig.
Control	25	12.920	2.120	4.494				

Table (16) shows the results of averages, standard deviations, T-test values, and their level of statistical significance from the post-application to test science processes as a whole and its sub-skills.

Table (16) results of a test in the post-application to test the processes of science as a whole sub-skills for the students of the two sets of experimental research and control

Skills	Group	No. of the sample	$\bar{X}$	SD	variance	D.F.	T-value		sig. at level 0.05
							Calc	Tab.	
Observation	Experimental	25	4.680	0.900	0.81	48	5.201	2.001	Sig.
	Control	25	3,240	1,052	1,107				
Classification	Experimental	25	3,680	0,476	0,227	48	5,043	2.001	Sig.
	Control	25	2,560	1,300	1.006				
Conclusion	Experimental	25	9,680	1,345	1,809	48	19,613	2.001	Sig.

	Control	25	2,920	1,077	1,160				
Deduction	Experimental	25	5,240	0,879	0,773	48	3,154	2.001	Sig.
	Control	25	4,280	1,242	1,543			2.001	Sig.

By extrapolating the results mentioned in the table, the following becomes clear:

a- *Observation*: It is clear from the table that the mean scores of the experimental group members are (4.680) A score, while the mean of the scores for the control group was (3,240) A degree, and the calculated (T-value) is (5,201) It is greater than the Tabular (T-value) of (2,001) at the significance level (0.05) and with a degree of freedom (48).

b- Classification: It is clear from the table that the mean of the scores of the members of the experimental group is (3.680) A score, while the mean of the scores of the control group was (2.560) A degree, and the calculated (T-value) is (5,043) It is greater than the Tabular (T-value) of (2,001) at the significance level (0.05) and with a degree of freedom (48).

c- Conclusion: It is clear from the table that the mean of the scores of the members of the experimental group is (9.680) A score, while the mean of the scores of the control group was (2,920) A degree, and the calculated (T-value) is (19,613) which is greater than the Tabular (T-value) of (2,001) at the significance level (0,05) and with a degree of freedom (48).

d- Deduction: It is clear from the table that the mean of the scores of the members of the experimental group (5.240) A score, while the mean of the scores of the control group was (4,280) A degree, and the calculated (T-value) is (3.154) It is greater than the Tabular (T-value) of (2,001) at the significance level (0,05) and with a degree of freedom (48).

Interpretation of results

The results resulted in the rejection of the first null hypothesis, which means that the experimental group students were superior in the post-test, and this result is attributed to:

1- Using the map of bubbles develops the student's ability to think because when students build these maps, they use some mental processes such as interpretation, balance, classification, and analysis, and these skills make them more active and effective, and they can think and find solutions when exposed to a problem.

2- The students have become practicing some thinking skills that can be applied in the academic content or tasks assigned to them. This result is consistent with the study of (Al-Talbani, 2010) and (Babtain, 2012).

3- The results showed acceptance of the second null hypothesis, as the control group members were equal in the pre and post-tests, as there was no statistically significant difference between them, and the researchers believe that the steps of the standard method did not sufficiently train the students on the skills of science operations. Thus this was negatively reflected in their performance in the pro-test.

4- The results of the research showed the rejection of the third null hypothesis, as the experimental group students who studied the map of bubbles outperformed the control group students who studied in the traditional (standard) method in developing the skills of science operations. The researchers attribute that to the following:

a. The topics of the rhetoric and application were prepared according to what the Bubbles Map requires of steps that have a significant impact on the learning process, as it contained many rhetorical activities that trained the students of the experimental group to generate questions on their own according to what the topics of rhetoric contained in the skills of science operations, Which led to the growth of the cognitive aspects of thinking.

b. The need for female students to break out of the traditional scope of the lesson and allow them to show their talents and creativity.

c. Teaching using the map of bubbles helped the student to build knowledge on her own. During the process of building knowledge, the student needs to practice the skills of various science operations in order to be able to build her knowledge correctly, and thus develop the skills of science operations through that.

5- The students of the experimental group have been affected by their use of the map of bubbles in developing the skills of science operations such as classification, observation, prediction, and conclusion, and this result can be interpreted as follows:

a- As for the classification skill, it facilitates placing the information in an organized context according to certain principles and specifications. The student begins by classifying her information according to specific schemes, and the classification skill develops with the knowledge and identification of the common characteristics of the concepts, then the information is placed in groups organized in a logical organization.

b- Regarding the skill of observation, the Bubbles Map calls for determining the correct point from which the search for the correct answer is supposed to start. The students 'attention is also directed to it by critiquing the answers and justifying them to ensure the correct direction towards the solution.

c- Regarding the skill of prediction, the map of bubbles invites the student to understand the phenomenon and explain the relationships and laws that govern them and organize their relationships with other phenomena in order to be able to predict. If the information does not reach the student clearly and simply, the student does not have a clear concept of it, and therefore she cannot predict new situations.

d- With regard to the skill of deduction, the map of bubbles prompted the students to reach the solution on their own and not be satisfied with the answer with yes or no, but rather delve into more knowledge to reach a brief generalization of the correct answer.

The researchers concluded that the students' ability to persevere and interact in the learning process and their tendency to calm increases their understanding of information, thus improving the level of their acquisition of information in science processes and the continuous desire of females to love curiosity and to know what is new that pushes them to practice and apply science processes in their daily life. The results of the study are in agreement with the study of (El-Telbani, 2010), (Babtain, 2012), (Abu Klopp, 2014) and (Nassar, 2015).

The size of the impact of the Bubbles Map on developing the skills of science operations:

The researchers calculated the size of the effect of the Bubbles Map on the development of the skills of science operations among the students of the experimental and control groups, using the calculation of n^2 Table (17) illustrates that.

Table (17) the (F) value and of n^2 for each dimension of the test and the total score of the test to find the size of the effect between the experimental and control groups

Dimensions	(F)	n^2	Effect size
Observation	5.201	0.360	large
Classification	5.043	0.346	large
Conclusion	9.613	0.658	large
Deduction	3.154	0.172	large
The total score of the test	14.728	0.819	large

It is evident from a table (17) that the size of the strategy's effect on developing the skills of the experimental group's students was excellent in all skills and the overall degree of testing the skills of science operations. We infer from this that the strategy encouraged students in the experimental group to use the skills of science operations, which removed them from shyness and fear and made them. They are interested in their studies, and this is due to the facilitation of communication and communication with each other and with the researcher, which helped them develop skills and create a spirit of competition and effective participation.

Conclusions

In view of the findings of the research, we have concluded:

1- The Bubbles Map strategy has proved to be successful within the limits of the current study in the production of research skills among 5th grade literary students in rhetoric and implementation in conjunction with the conventional (standard) methods.

2- The Bubbles Chart approach has a significant influence on the growth of expertise in research operations.

3- Studying with the Bubbles Chart allowed students to take an active and constructive role in the course, which implies developing trust so that they can share their thoughts and views on the quality of the subject.

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