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The Effect of the Over Lapping Waves Strategy on the Collection of Mathematics among Students of the 5th Preparatory and the Development of Intelligent Thinking

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Abstract--- *The current era of rapid developments, is an accelerating era information in all areas of life, it was necessary to walk along and catch up and absorb this huge amount of information. Information literacy no longer fulfills the purpose, so the educators raised the slogan(11) "teach me how to learn" through the transition form traditional teaching methods to those based on the work of the mind of the learner and it's the student should be a good thinker and acquire proper knowledge structures, his imagination leads him to assimilate information and extract and derive good information, and degen to go in the preparation of curricule and the search for positions that raise students thinking the researchers took upon themselves to carry out research and research related to thinking in order the produce conclusions and recommendations that support the idea of of activating the role of the student and came in the principles and standards which was issued by the national council for teaching mathematics (12,13,14,15) In the United States, stressing the urgent need to help students see mathematics as a thought-provoking topic, as well as invitations to many seminars and conferences to develop appropriate solutions and care for the development of thinking and skills.*

Keywords--- *Over Lapping, Waves Strategy, Intelligent Thinking*.

I. THE PROBLEM OF RESEARCH AND IMPORTANT

The current era of rapid developments, is an accelerating era information in all areas of life, it was necessary to walk along and catch up and absorb this huge amount of information. Information literacy no longer fulfills the purpose, so the educators raised the slogan(11) "teach me how to learn" through the transition form traditional teaching methods to those based on the work of the mind of the learner and it's the student should be a good thinker and acquire proper knowledge structures, his imagination leads him to assimilate information and extract and derive good information, and degen to go in the preparation of curricule and the search for positions that raise students thinking the researchers took upon themselves to carry out research and research related to thinking in order the produce conclusions and recommendations that support the idea of of activating the role of the student and came in the principles and standards which was issued by the national council for teaching mathematics (12,13,14,15) In the United States, stressing the urgent need to help students see mathematics as a thought-provoking topic, as well as invitations to many seminars and conferences to develop appropriate solutions and care for the development of thinking and skills. Based on that learning is built through the experience and work, not through memorization and conservation. (19)

Mathematics requires different thinking skills as indicated. (10) That the availability of basic thinking skills leads to more effective use of mind to the maximum capacity to reach the so-called maximum thought (9)

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Fakhro Said that the thinking of students at the end of the middle school is dominated by abstract thinking. The student does not accept dealing with issues and problems in a concrete manner, but tries to think things just. He tries to represent the problem and transform it into a set of mental images to reach its solutions. And then apply them to reality.(17) his intelligence at this stage tends to be almost complete. He tends to pay more attention to intellectual problems and social issues than to school curricula. He generally needs to deal with problems procedurally and efficiently by knowing what to do and what cant be done when facing a problem (7)

The choice of the appropriate method to teach a subject has a great impact on achieving the goals of the khaddar and different methods very subjects, materials and teaching and the preparation of learners and generally the greater the participation. .(6)

And that The most important solutions to these difficulties are the adoption of strategies that emphasize thinking and smart thinking, including the overlapping waves strategy, so this study was an attempt to identify the best methods and strategies which can be used in the intelligent thinking of students in light of the above the problem of research determines the answer to the following question : what is the impact of using the strategy of waves intertwined in the collection and development of intelligent thinking among students in the fifth grade scientific in mathematics?

The importance of the current research is reflected in the following points:

1. The approach of nadriss with the strategy of the intertwined waves has a prominent role in making the student a focus on the educational process. The present study tries to study applications of the educational theories that came out of the theories of teaching in achieving that. Many teachers do not direct students to shift their thinking from the physical world to the conceptual and abstract concepts To grow and have the ability to deduce.
2. The higher the performance of mental students has some difficulties when teaching in the usual way. So the researcher tries to experiment a new method is teaching the strategy of waves overlapping.
3. The importance of the preparatory stage because it is an important stage of education as the students move to the stage of independence, and self-reliance.

Terminology

Surfing Strategy:

Qatami defined it as:

" A set of thought processes linked to the growth and cognitive adjustment of permanent concepts

Cognitive Modification, "and at every stage the learner struggles to reach a state of cognitive equilibrium between what he knows, what he wants to know, what he processes, and what he wants to address, to reach the desired state of mental therapy" (16)

Allam defines it as "the degree of acquisition attained by the individual, the level of success achieved by him, or his access to a subject, field of instruction, or specific training" (2)

Costa and Kalick have developed a clever thinking:

Is the tendency of the individual to behave intelligently when confronted with the problem of what the answer or solution is not available in the cognitive structure of the individual. Any pattern of intelligent

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behaviors that lead us to productive actions when faced with dilemmas, refers to employing intelligent behavior when the individual does not know the answer or the appropriate solution(3)

Research Goals

1. The current research aims to: - Identify the impact of teaching using the strategy of overlapping waves in:
2. The collection of mathematics in the fifth grade students.
3. Development of a clever thinking of mathematics in the fifth grade scientific students.

Search Limits

Current search restricted to:

- Human Limitation: High School with Al-Sawary for girls / Rusafa 2
- Time limit: three chapters of the book of mathematics scheduled for the fifth grade scientific, for the year (2017/2018)
- The spatial limit: the province of Baghdad

Theoretical Framework

Thinking is a topic that directly affects the lives of individuals and communities. It also contributes to helping individuals adapt to current and emerging situations and also to the survival, growth and development of societies.

Although thinking refers to the inner activity of the individual, the nature of the thinking activities varies in terms of quality and nature, from which it is simple and direct, especially those that are related to familiar things, such as solving a problem or creating new solutions (20)

Jarwan believes that intelligent thinking does not grow automatically, it requires systematic and purposeful learning, and that the most successful people in thinking about a subject are the most knowledgeable, but knowledge alone is not enough. Be thoughtful about the subject, and product (8).

Cross – Wave Strategy

1. Encourage problem-solving skills, by speaking out loud, to another interested listener.
2. Enhance and improve students' oral communication skills.
3. Allow the teacher to arrange his / her transition from one step or concept to another in the classroom.
4. Exchange and exchange ideas and ideas among students.
5. Increase students' awareness and awareness of the mental and cognitive processes used to solve the problem.

Expanding the horizons of students in the possibility of using a variety of problem solving strategies, not only thinking about a particular type of traditional strategy (16)

Cromley Identified the Difference between Intelligent Thinking and Novice Thinking (4)

Think novice	Thoughtful thinking	property	Number
Without patterns: reading materials and problems as if they were unconnected facing and focusing their attention on similar and unimportant issues	There are patterns : they know what they notice when they have a problem task	Patterns	1
They know a few facts and these facts are	They know a lot of facts in their	Knowledge	

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unorganized	field and these facts are well organized		2
Surface Understanding and look at the similarity between the parts of the subject, but superficially and ostensibly	Because they have a deep understanding of the subject and see how the parts of the subject relate	Understanding	3
They know a few problem-solving techniques as they do not know when to use them	They know many strategies, problem-solving methods in their field, and know when to use each method or strategy	Strategies	4
They do not have self-awareness, they do not know when to understand and when they do not understand	They have an awareness that they can know when they understood the subject, and when they did not understand	Self- aware	5
They work confidently even in basic skills so most of their attention goes on	They know basic skills well, and they work mechanically	Automatic	6
Their memory is bad and slow	They remember better and faster	Memory	7
Solve a few problems, and slowly solve them routinely, and deal with problems to solve	They solve many problems quickly, come up with better solutions, and deal with problems to understand	Problem Solving	8
Their mental models are unorganized	Mental models are more organized, and they know when to use them	Mental Models	9

II. RESEARCH METHODOLOGY AND PROCEDURES

First: Experimental Design

The researcher chose one of the partial control designs by a post-test and two groups, namely the experimental design of two parallel sets of the post-test (5) because it is suitable for the research hypotheses and its variables. The design is as shown in the following table(2): (1)

Authorized Experimental Design

Dependent variable	Independent variable	Equalize both groups	The group	
The collection of mathematics And intelligent thinking	The Over Lapping Waves Strategy	- Previous achievement in Mathematics, - Intelligence -Age	The experimental group	1
			The control group	2

Second: - Research Community and Sample

The current research community is represented by fifth graders in the secondary girls' secondary schools of the Directorate General of Baghdad Governorate Education / second Rusafa for the academic year 2017 - 2018.

The researcher chose the sample of the research in an intentional way from the secondary school of Al-Sawary for Girls to be the field of the current research.

She chose two divisions in the simple random drawing method (Division C) to represent the experimental group that teaches mathematics according to the strategy of the overlapping waves.

Mathematics according to the usual method of teaching.

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The number of students in the research sample was (56) students, (28) for the experimental group and (28) for the control group after exclusion of female students.

Third: Control Procedures

- ***Internal Safety of Pilot Design***

Prior to the actual teaching, the researcher was keen on the equivalence of the students of the two groups of research statistically in a set of variables that she believes may affect the safety of the experiment and the accuracy of its results. These variables are:

- ***External Safety***

In spite of the parity procedures between the experimental and control groups in three variables that may affect the dependent variables, the researcher attempted, to the extent possible, to avoid the effect of any extraneous variables that may affect in one way or another the safety and conduct of the experiment and hence its results.

In order to mask their effect on dependent variables, these variables are:

(Experience secret, course material, teaching aids, material teacher, place of experiment, duration of experiment)

Fourth: Research Requirements

1. Determining the educational material: The researcher determined the educational material that will be taught to the students of the two groups of research during the period of the experiment, from the mathematics book to the students of the fifth grade scientific application branch (chapters I, II and III) for the academic year 2017 -2018 AD.
2. Identifying Behavioral Objectives: The researcher, derived a number of behavioral objectives related to the research material, in which 126 behavioral goals were formulated.
3. Preparation of teaching plans

The researcher prepared (45) teaching plans for both groups (experimental and control)

Fifth: Research Tool

Preparation of the two tests and intelligent thinking: The researcher prepared two tests of the first type of choice of multiple choice type (four alternatives), the second test of intelligent thinking The researcher has formulated (20) experimental paragraph in both tests, and ascertained the characteristics of the cykometric of the two tests:

Validation of the test: Guarantees virtual honesty b. Statistical analysis of the two test paragraphs: The difficulty and discrimination of the two test subjects and the effectiveness of the wrong alternatives were identified.

Stability of the test: According to the researcher the stability of the test of achievement in equation (K-R20) with a coefficient of stability (87.0) or the test of smart thinking used the method of retesting to measure its stability

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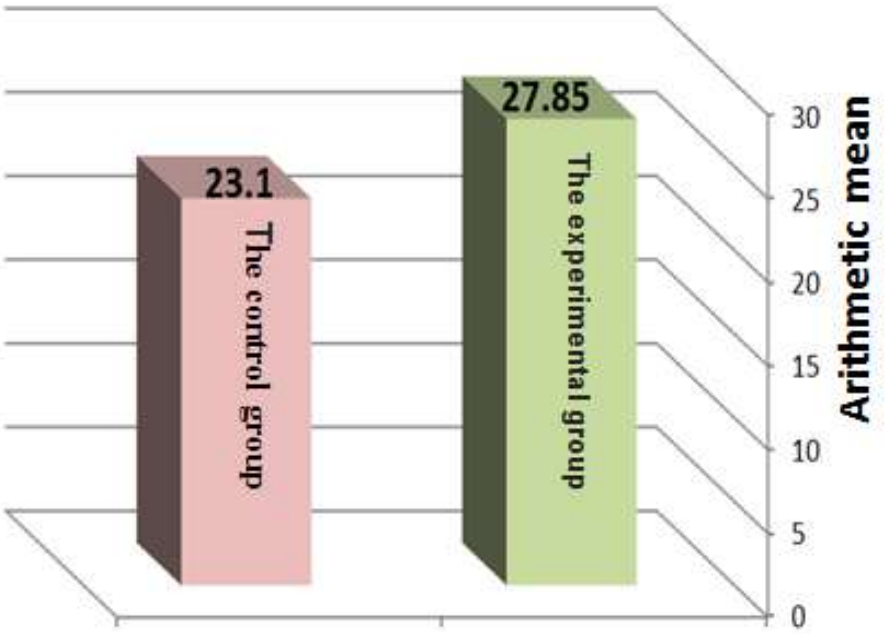
Sixth: Procedures for Applying the Experiment

1. Application of the experiment: Run out the experiment in the first semester of the academic year 2017 - 2018 m.
2. Application and correction of the test: The two tests were applied. The researcher corrected the experimental papers and the scores were recorded in the two groups (experimental and control) and they are prepared for statistical processing to reach the results related to the current research objectives. Seventh: Statistical Methods: The researcher used the appropriate statistical methods in the current research using the statistical program (SPSS) To test the significance of statistical differences between the arithmetic mean between the scores of students in the two groups of research in achievement and intelligent thinking .
3. The coefficient of difficulty of the paragraphs This equation was used to calculate the coefficient of difficulty of the tests and the smart thinking
4. The effectiveness of the wrong alternatives: Used to find the effectiveness of the wrong alternatives to the paragraphs of the type of multiple choice in the test of achievement and smart thinking .
5. The coefficient of the percentage agreed (Cooper equation): The coefficient of the percentage agreement was used to calculate the proportion of the agreement of the arbitrators in the validity of the behavioral objectives and the test scores, as well as for the correction of the test correction.

III. THE RESEARCHER REACHED THE FOLLOWING RESULTS

For the purpose of verifying the first hypothesis, which states that:

There are statistically significant differences in the experimental group studied using the overlapping wave strategy on control group members studied using the normal method of mean collection test, (23.10), while the average score of students in the control group (27.85), which is a clear difference in the math averages for the performance of female students The scientific V in achievement as shown in the chart (1)



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Using the T-test for two independent samples, the calculated T value (3.84), which is greater than the tabular value of the significance level (0.05) and the degree of freedom (54) which is equal to (2), is statistically significant for the experimental group, Who studied during the duration of the experiment using the strategy of overlapping waves on the students of the control group who studied the usual way in the test of intelligent thinking as shown in Table (3)

level (0.05)	t-value		Degree of freedom	Contrast	Middle of arithmetic	Sample size	The group
	Crosstab	Calculated					
دالة	2.00	3.48	54	19	27.85	28	the experimental group
				21.23	23.10	28	the control group

Impact Size

Means the difference between the mean of each of the experimental and control groups in the collection variable divided by the standard deviation of the control group. Knowing the magnitude of the effect helps us determine the relative impact of a particular educational process and to determine the level of impact,

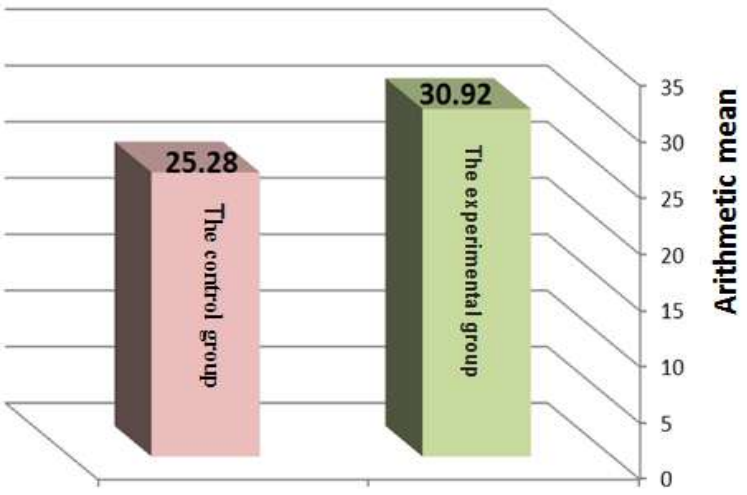
- Less than 0.2 weak
- Between 0.2 - 0.8 average

0.8 •or greater. (18)

The impact on the collection variable was 0.975, so the magnitude of the impact in the overlapping wave strategy is significant.

For the purpose of verifying the second hypothesis, which states that there are statistically significant differences in favor of the experimental group studied using the overlapping wave strategy on control group members studied using the usual method of developing intelligent thinking.

The average score of the experimental group in the test was 30.92 and the average score of the control group (25.28), which is a difference in the mathematical averages of the performance of the fifth grade students in the achievement as shown in Diagram 1



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Using the T-test for two independent samples, the calculated T value (4.41), which is greater than the tabular value at the significance level (0.05) and the degree of freedom (54) which is equal to (2), is statistically significant for the experimental group, Who studied during the duration of the experiment using the strategy of overlapping waves on the students of the control group who studied the usual way in the test of intelligent thinking as shown in Table (4)

Table 4: The Arithmetic Mean, the Standard Deviation and the Calculated T Value of the Students' Experimental and Control Group Scores in the Intelligent Thinking Test

level (0.05)	t-value		Degree of freedom	Contrast	Middle of arithmetic	Sample size	The group
	Crosstab	Calculated					
دالة	2.00	4.41	54	4.72	30.92	28	the experimental group
				4.83	25.28	28	the control group

The magnitude of the effect of the variable of scientific thinking was (1.167). Therefore, the magnitude of the effect in the strategy of overlapping waves is on the highly intelligent thinking

Second: Interpretation of the results:

It is clear through the results of the researcher that the use of the strategy of overlapping waves the positive impact in increasing the achievement of students in the fifth grade scientific application branch, due to the following reasons:

1. Teaching in accordance with the strategy of overlapping waves provides students with the opportunity to build their knowledge through positive interaction with the teacher of the material, as well as interaction between the students themselves to communicate among themselves through the exchange of views and dialogue, which may raise the interest of students and the advancement of their scientific level to the maximum of their abilities and potential And their capabilities.
2. The interaction of educational attitudes was observed, as the strategy of overlapping waves contributed to helping students to participate positively, thus enhancing self-confidence and the ability to conclude.
3. Teaching in accordance with the strategy of overlapping waves worked on the transfer of students from the state of direct reception of information to researchers themselves and to make students center for the educational process and this is contrary to the usual way in which the teacher is the focus of the educational process and the student is the recipient of information and its role is limited only to the conservation and implementation of information.
4. The use of the strategy of overlapping waves has a positive effect on the development of intelligent thinking among the students of the fifth grade scientific application branch, due to the following reasons:

1. The use of the strategy of overlapping waves was an incentive to stimulate the intelligent thinking of students to research and investigate the facts and information and reveal their ambiguity in the content of the course while reading, finding what is true and judging the validity of information, which stimulated intelligent thinking.
2. The active role of students in the course of teaching, and their interaction in the presentation and presentation of the lesson, has given them self-confidence in how to deal with different positions and this in turn led to increasing the desire of students in the search for facts and inquiry about the outstanding

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information through the multitude of questions and queries, The strategy of overlapping waves has led to the development of intelligent thinking among students.

3. The use of strategy overlapping waves allowed the students the opportunity to shift in the thinking mode from one position to another and encouraged them to practice many types of thinking, including smart thinking and training to accept the views of their colleagues during the teaching and helped them to free from inertia in thinking and make them mentally open and gain the courage to show And offer new solutions and this increases the ability of students to think smart.

IV. CONCLUSIONS

1. The strategy of overlapping waves proved to be effective within the limits in which the current research was conducted in increasing the achievement and development of intelligent thinking among the students of the fifth grade scientific branch applied in balance with the usual method of teaching.
2. The application of the steps of the strategy of overlapping waves helped to stimulate the intelligent thinking of students and love to participate in the activities of the lesson, which generated a desire towards the subjects of mathematics.
3. Teaching in accordance with the strategy of overlapping waves develop students' abilities to think carefully.

RECOMMENDATIONS

In the light of the findings of the present study, the following recommendations can be made:

1. Encouraging the use of modern teaching models, especially the strategy of overlapping waves in the teaching of mathematics to raise the level of achievement and the development of intelligent thinking.
2. The need for the introduction of mathematics teachers training courses to introduce them to the modern teaching strategies, including the strategy of overlapping waves.
3. Training the students of the faculties of education and basic education to use the strategy of overlapping waves in addition to other modern strategies.
4. the need to use careful thinking in training courses for educational institutions

PROPOSALS

1. Conduct a similar study for the current study in other study stages.
2. Conduct a comparative study between the impact of the strategy of overlapping waves and other learning models in the development of intelligent thinking for the stages of another study.
3. Conduct a similar study on the males to know the impact of the strategy of waves overlapping in the collection and development of intelligent thinking and some other variables.

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