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THE IMPACT OF THE TLK BASIC CROW STRATEGY ON THE ACQUISITION OF MATHEMATICS SUBJECT FOR MIDDLE SCHOOL STUDENTS

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Abstract

The aim of the research is to investigate the impact of the TLK BASIC CROW strategy on the acquisition of mathematics subject for middle school students. In order to achieve the research objective, the researcher tested the null hypothesis, which stated that there is no statistically significant difference at a significance level of (0.05) between the mean scores of students in the experimental group studying according to the TLK BASIC CROW strategy and the mean scores of students in the control group studying according to the traditional method in the achievement test. The research population consisted of middle school students in Baghdad within the Directorate of Education Baghdad Al-Karkh First. The research sample was randomly selected from Baghdad Boys Middle School, totaling (60) students, with (30) students in the experimental group and (30) students in the control group. The researcher verified the validity and reliability of the achievement test in mathematics for second-grade middle school students. The researcher used the Statistical Package for the Social Sciences (SPSS) for data analysis, and the following results were obtained: There is a statistically significant difference at a significance level of (0.05) between the mean scores of students in the experimental group studying according to the TLK BASIC CROW strategy and the mean scores of students in the control group studying according to the traditional method in the achievement test, in favor of the experimental group.

Keywords: Impact, TLK BASIC CROW strategy, Mathematics achievement, Middle school students.

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Chapter One: Introduction to the research

Research problem

This strategy is considered an interactive educational method that encourages student participation and motivates them to explore knowledge on their own. This strategy is expected to motivate students to interact with academic materials in a way that contributes to the development of critical thinking and problem-solving skills in mathematics. It is also expected that the strategy will contribute to enhancing interest in the subject and increasing the level of understanding and academic achievement of students in this field. The study will be carried out using an experimental survey approach with students divided into two groups, one of which will follow a strategyTLK BASIC CROW while the other group follows traditional methods of teaching. Student achievement in the subject will be measured using standardized tests, and the results are expected to show a positive effect of using the TLK BASIC CROW strategy on student achievement in mathematics. The problem of the study arises in the following question: What is the effect of the TLK BASIC CROW strategy on mathematics achievement for middle school students? ?Top of Form

Research Importance

Addresses the importance of research on the impact of strategyTLK BASIC CROW The mathematics achievement of middle school students is an issue of great importance in the field of education. This research seeks to understand how this strategy affects students' achievement in mathematics, which has many dimensions. First, this research can contribute to the development of teaching and learning methods, as the TLK BASIC CROW strategy is considered among the interactive methods that may enhance the effectiveness of learning and motivate students to participate effectively in the learning process. Secondly, this research can contribute to improving the quality of mathematics education and increasing the level of students' understanding and achievement in this field, which enhances the educational success of students and contributes to improving their academic skills. Ultimately, this research can provide a valuable scientific contribution to the field of education, as it provides a deep understanding of the impact of the TLK BASIC CROW strategy on students' mathematics achievement and can contribute to better and more effective guidance of education policies and educational curriculum development.

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Research Objective

The current research aims to identify the impact of the strategyTLK BASIC CROW in mathematics achievement for middle school students.

Research hypothesis:

There is no statistically significant difference at the significance level (0.05) between the average grades of the experimental group students who study according to (the strategyTLK BASIC CROW) and the average scores of the control group students who study according to the usual method in the achievement test.

search limits

Objective boundaries: The impact of a strategyTLK BASIC CROW in mathematics achievement for middle school students.

Time limits: The research was conducted in the 2024 academic year.

Spatial boundaries: Baghdad Middle School for Boys - Baghdad Al-Karkh First Directorate of Education.

Define terms

Impact

- It is the result of desirable or undesirable changes that occur in the learner's capabilities due to the intended learning procedures carried out by the teacher." (Shehata and Zainab, 2003: 22)

- It is what the learner sees in terms of features, fingerprints, changes, or effects in the thing that affects him. There is an influencer and an influencing person in the sense of an independent variable that affects the dependent variable. (Al-Saqqaf, 2007: 19)

The strategy

- "A set of pre-planned teaching procedures" to implement teaching in order to achieve certain goals according to what is available or available capabilities. (Al-Hila, 2002: 52)
- "A set of procedures and practices that the teacher follows in the classroom to reach outcomes in light of the goals set by the teacher. It includes a set of methods, means, activities, and evaluation methods that help achieve the required goals." (Shehata and Zainab, 2003: 39)

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Operational definition of strategy

It is a series of organized actions aimed at achieving a goal (Charles, 1962, p. 13).

Collection

- A specific level of achievement or proficiency in school work, measured by teachers, or prescribed tests. (Al-Issawi et al., 2006: 13)
- The outcome of what the student learns after a specific period of time has passed can be measured by the grade the student obtains in an achievement test in order to determine the success of the strategy that the teacher develops and plans to achieve his goals. (Abu Jadu, 2008: 465)

Procedural definition of collection

It is the extent to which students in the third grade, average, have achieved in mathematics, measured by the score that the student obtains in the achievement test prepared for the purposes of the current research.

Strategy TLK BASIC CROW

This strategy is an educational approach based on the concept of active learning, where students are encouraged to actively participate in the learning process by actively exploring and interacting with the study materials.

This strategy relies on encouraging students to think critically, research and analyze, as their mental abilities are activated by participating in stimulating discussions and educational activities.(Rayan, 2012: 46).

This approach focuses on enhancing student interaction in the educational process, as it encourages students to interact with the academic content directly through group activities and discussions.

This strategy is considered a way to enhance students' self-independence, as they are encouraged to acquire knowledge and skills through effective interaction with the academic content without the need for constant guidance from the teacher.

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Chapter Two: A theoretical framework and previous studies

First: a theoretical framework

The foundations on which the strategy was based:TLK BASIC CROW

- The student acquires knowledge himself.
- The student interacts with the discovered cognitive environment.
- The student reaches new ideas and generalizations automatically.
- Linking new knowledge and integrating it with the student's previous cognitive structure.
- Building cognitive mental structures.
- Paying attention to the student's internal motivations.
- Paying attention to the student's mental activity.
- Using appropriate stimuli (Al-Hams, 2020, p. 153)

Strategic characteristics: TLK BASIC CROW

- It strengthens the student psychologically and mentally, develops his abilities, and strengthens his weaknesses.
- Improving the student's skill level and raising his mental efficiency.
- It makes the student able to search for knowledge instead of just acquiring it
- In their study of mathematics in particular, students move from the stage of knowledge about something to the stage of knowledge through practice and application.
- In mathematics, quantitative changes turn into qualitative changes at certain points.
- The student's mental characteristics and personal traits improve, such as curiosity, motivation, attention, open-mindedness, and others. (Al-Hams, 2020, 154).

Strategic Importance: TLK BASIC CROW

The importance of this strategy is evident in its diversity due to the presence of more than one strategy and its reliance on thinking. Its importance is highlighted in the following:

1. It has a major role in enhancing students' abilities and revealing their potential.

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2. It helps in activating students' thinking, creativity, analysis and discussion abilities and skills.
3. It has the ability to develop their aptitude for creativity.
4. It contributes to enriching students' information and developing their various mental skills.
5. Training students on creativity and the ability to produce new and different things. (Al-Hams, 2020, 154)

The role of both the teacher and the learner in a strategyTLK BASIC CROW

The role of the teacher in strategyTLK BASIC CROW

The role of the teacher has changed in active learning strategies, as he is no longer the prompter and the only source of information. Rather, he has become the guide, guide, and facilitator of learning. He does not control the educational situation as in the traditional style, but rather manages the educational situation intelligently, prepares students, and helps them gradually to carry out their new roles and acquire qualities and life skills, and from here. The researcher concluded that the strategy

(Al-Hams, 2020, 154)

It requires the teacher to perform the following roles:

1. Using many educational activities and educational methods according to the educational situation and the students' abilities, in order to achieve diversity in the assignments and assignments assigned to the students, so that each student is given according to his abilities and capabilities, which ultimately leads to an active and interactive environment.
2. Recognizing students' strengths and weaknesses so as to provide them with opportunities for greater success in areas that are difficult for them and a better degree in areas in which they are competent and distinguished.
3. Diversity in teaching methods and the ability to address each strategy in the time allotted for it in the classroom to achieve the desired goal.
4. Focusing his efforts on guiding, advising, and helping students achieve learning goals instead of teaching them. The teacher teaches students how to think, not what to think.
5. Working to increase students' motivation to learn.
6. Making the student discoverer, trained and effective in the educational process.

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7. Always putting the student in situations where he feels challenging and exciting because of its impact on the learning process and stimulating his interest, motivation and motivation towards learning.
8. He cooperates with fellow teachers of different subjects and activities to encourage strategic approachTLK BASIC CROW

The learner's role in strategyTLK BASIC CROW

Based on the focus of active learning on the positivity and participation of the learner and that it has become the focus of the educational process, defining the role of the learner in the active educational situation in a strategyTLK BASIC CROW includes the following: (Al-Hams, 2020, 155)

- The student enjoys an active learning situation in strategyTLK BASIC CROW with positivity and effectiveness.
- The student participates in planning and implementing the strategic steps.
- The student searched for information himself from multiple sources.
- The student practices various educational activities, such as learning through play and role-playing.
- He participates with his colleagues in group cooperation.
- He takes the initiative to ask questions, analyze or comment on what is said, or presents new ideas and opinions.
- He has the ability to discuss, manage dialogue, and compare the solution method used with his peers.

Obstacles to implementing a strategy TLK BASIC CROW

Obstacles to adopting a strategy on several issues, including the teacher's understanding of the nature of his work and roles, the discomfort and anxiety resulting from the required change, the use of more than one strategy in a single educational situation, and the lack of incentives required for change. (Al-Hams, 2020, 156)

The obstacles can be summarized in the following points:

1. Fear of trying anything new.

2 Fear that learners will not participate and will not use higher-order thinking skills.

3 Not learning enough content.

4. Fear of losing control over learners.

5. Lack of teachers' skill in managing discussions.

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6. Lack of teachers' skill in combining more than one strategy for teaching the subject matter.
7. Fear of others' criticism for breaking the norm in education.
8. The need for great effort and time during implementation and application.

Second: Previous studies

The researcher did not find any local or Arab study to the best of her knowledge.

Chapter Three: Research methodology and procedures

Research Methodology

It is the method followed by the researcher to achieve the desired goal, and it is a set of foundations, rules, and methodological steps that the researcher relies on in organizing the work he does, with the aim of exploring scientific facts or conducting accurate examinations about them (Abdul Rahman and Zangana, 2008: 15). The researcher took a number of procedures required to complete the research, including the following:

First: Experimental design:

It is considered essential in the research process, and must be chosen based on the objectives of the study and the variables to be studied, in addition to the circumstances in which the research will be carried out. The more the experimental design is chosen based on these factors, the more accurate the results will be obtained through data analysis. Hence, these results can be considered more accurate and objective, thus making a greater contribution to the research field in question (Raouf, 2001: 179).

Therefore, in her study, the researcher relied on an experimental design with partial control and posttesting, which includes two groups: the experimental group that is exposed to the independent variable (strategyTLK BASIC CROW), and the control group taught in the usual way. Upon completion of the experiment, the final achievement test will be administered. Details can be found in Table (1).

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Table (1) Experimental design of the research sample

Posttest	Dependent variable	Independent variable	variablesEquality of the two groups	the group
a test Collection	•Collection	Strategy TLK BASIC CROW	•Collectionthe previous •Chronological age calculated in months •Previous knowledge • Intelligence	Experimental
		The Roadusual teaching		Female officer

secondly: Research population and sample

A- The current research population consists of second-grade intermediate students in government morning schools in the center of Baghdad, affiliated with the General Directorate of Education of Baghdad Al-Karkh I Governorate, for the academic year (2023-2024 AD)..

B- Research sample

As for the sample, it is a selected part of the original research community, and it is representative of it in a way that is considered acceptable. The researcher selects this sample using different methods, and it includes a number of individuals from the original community. (Al-Duailej, 2010: 114)

Before starting the experiment, the researcher selected a sample of second-grade middle school students studying at Baghdad Middle School for Boys, affiliated with the General Directorate of Education of Baghdad Al-Karkh I. Since there are three sections for the second intermediate grade, the researcher randomly selected two sections to represent the two groups, where section (C) represents the experimental group and section (A) represents the control group..

After statistically excluding the students who failed, which numbered five students (two students in the experimental group and three students in the control group), the number of members of the final sample reached 60 students. Section (C) was represented by 30 students, which is the experimental group, and Section (A) was represented by 30 students, which is the control group. It should be noted that the researcher excluded students who failed statistically, and an explanation of this can be found in Table (2).

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Table (2) Number of students in the experimental and control group before and after exclusion.

Number of students after exclusion	Number of students excluded	Number of students before exclusion	Division	the group
30	2	32	C	**Experimental Female officer the total**
30	3	33	a	
60	5	65		

Third: The equality of the two research groups

Before starting the experiment, the researcher was keen to ensure that the members of the two research groups were statistically equal in some important variables, namely intelligence, previous achievement, previous knowledge, and chronological age. The results presented in Table (3) indicate the equality of the difference between the two groups in all these variables.

Table (3) T-test results for the two research groups on the equivalence variables

indication	the valueT. tabularis	the valueCalculated T	variance	SMA	the number	the group	Variables
There is no significant differenceStatistically at the level of (0.05)	2	1.242	224.047	65.5667	30	Experimental	**Previous attainment**
			175.886	70.1	30	Officer	
	2	0.411	66.447	20.9667	30	Experimental	**Intelligence**
			66.851	20.1	30	Officer	
	2	0.129	8.34	12.033	30	Experimental	**Previous knowledge**
			9.7	11.933	30	Officer	
	2	0.957	4.47329	30	30	Experimental	**the ageCalculated in months**
			5.45788	30	30	Officer	

Fourth: Research requirements

Determine the scientific subject: The researcher determined the scientific material that would be taught to the students of the two research groups during the experiment period, in the chapters on operations on groups, relationships on the group, and operations on rational numbers from the mathematics book scheduled to be taught to the second intermediate grade in the academic year (2023 AD - 2024 AD). This subject will be taught during the first semester of the year.

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Formulating behavioral goals:

•**Behavioral goal**It is defined as any change that is sought to be achieved in the learner's behavior after passing through a specific educational experience. This change must be clearly and specifically formulated in a detailed sentence known as an objective statement. The process of formulating behavioral objectives is considered an essential and vital step in preparing any educational program. Because it explains to the learner what he must achieve after completing his study of the educational content of the program. (Al-Hila, 1999: 80). After reviewing the general and specific educational objectives for mathematics for the second intermediate grade, and based on sources, literature, and the opinions of mathematics teachers and methods of teaching it, the researcher formulated a number of behavioral objectives specific to the content of the research subject. It formulated a total of (126) behavioral objectives, according to Bloom's classification for the first three levels (remembering, understanding, applying). The goals were formulated with behavioral actions that could be observed and measured, and these goals were presented in their initial form to a number of arbitrators and specialists to verify their suitability to the level of the goal they measure.

Numbers of teaching plans: Planning for teaching means developing a comprehensive framework that includes the steps, procedures, methods, and activities necessary to achieve specific goals within a specific period of time, and ensuring the achievement of these goals. The researcher prepared daily teaching plans for the topics that would be studied in the experiment. Two model plans of these plans (for both the experimental and control groups) were presented to a number of experts and specialists in curricula and methods of teaching mathematics, as well as to the subject's teachers, to benefit from their opinions. Based on these opinions, the researcher prepared the rest of the teaching plans.

Fifth: Search tool: The researcher prepared an objective achievement test. She chose this type of test because it is characterized by accuracy and stability and is not affected by the personal factors of the grader. It also includes a representative sample of the behavior to be measured, according to what the researchers stated (Al-Zaher et al., 1999: 62).

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Based on the directions of a number of measurement and evaluation experts, the researcher decided to use a multiple-choice test as a means of measuring educational results based on different mental levels. Multiple choice tests are one of the best types of objective tests because of their ability to accurately measure these outcomes.

Then the researcher prepared the achievement test according to the following steps:

1- Formulating the test items: Among the requirements of this research is the use of only one tool, which is an achievement test, to determine the extent to which the research objectives and hypotheses have been achieved. The researcher prepared a multiple-choice achievement test, which consists of 42 items.

Validity of the test: The researcher presented the test items to a number of experts and specialists in mathematics teaching methods, and in educational and psychological sciences, to obtain their opinions and suggestions. Based on these opinions and suggestions, the researcher modified some of the paragraphs, which led to reducing the number of items in the test to 40..

Survey application for the achievement test: To ensure the clarity of the test items and its validity, and to analyze its items statistically (finding the difficulty coefficient, the strength of discrimination of the items, and the effectiveness of the wrong alternatives for each item of the test). And to ensure its stability, the researcher applied the test to an exploratory sample approximately similar to the basic research sample on 12/15/2023, corresponding to Sunday. , as it was composed of(60) students.

Statistical analysis of test items:

Determine the difficulty factor: It is the ratio of students who answered the paragraphs correctly from both groups to the number of students in the upper and lower groups. (Al-Absi, 2010: 205)

According to what is stated in the literatureAny paragraph within the distribution of difficulty coefficients ranges between(0.20-0.80)It is acceptable. (Anastasia, 1976: 209)

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After the researcher calculated the difficulty factor of the items using the equation (difficulty factor) for any of the test items, she found that it ranged between (0.39 - 0.76) This means that all test items are acceptable in terms of difficulty and applicability.

Paragraph recognition factor: The strength of an item's discrimination means the extent of its ability to distinguish between students with high and low levels regarding the characteristic that the test measures. (Stanley, 1972:450)
After the researcher calculated the discriminatory power of each test item according to its discrimination equation, it was found that its discriminatory power ranged between (0.38-0.77).
That ipl(Ebel, 1972) provided us with evidence that uses a criterion to compare the discriminatory power of paragraphs according to the discrimination coefficient. If the paragraph has a discrimination coefficient greater than 0.19, it is considered to have acceptable discrimination. (Al-Absi, 2010: 208) Thus, all test items are considered good and acceptable in terms of their discriminatory ability.

C - Stability:
The concept of reliability in a test refers to its ability to give close or identical results when applied repeatedly under similar conditions. The length of the test affects its reliability, as the stability of the test increases as the number of items in it increases.
After applying the test to the exploratory sample, the researcher calculated the test's reliability coefficient using the Cronbach Alpha-20 equation(KR-20), which is an equation used to calculate the stability of items in objective multiple-choice tests.

Sixth: Applying the experience
The researcher applied the experiment in the first semester of the academic year 2023 AD - 2024 AD after the researcher completed the requirements for conducting the experiment, including selecting the two groups, achieving parity between them, and determining the scientific subject. She began implementing the experiment on the day Sunday 10/9/2023 and ended on Monday, 12/18/2023,

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as the experiment was completed by applying the research tool (achievement test).

Seventh: Statistical methods: In analyzing the results, the researcher used the following statistical methods:

1- T-test(t-test) for two independent samples is used for several purposes, including knowing the equality of the experimental and control groups in several variables such as previous achievement in mathematics, previous knowledge, intelligence, and chronological age. It can also be used to determine the significance of the statistical differences between the average scores between the two groups to verify the research hypotheses.

In the current research, I used the t-test to verify the equality of the experimental and control groups in prior achievement in mathematics, prior knowledge, intelligence, and chronological age..

In addition, I used the test to verify the presence of statistical differences between the students' grade averages, in order to verify the validity of the null and secondary hypotheses of the research..

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{S_1^2(n_1-1)+s_2^2(n_2-1)}{(n_1+n_2-2)}\right)\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$$

2- Difficulty factor for objective paragraphs: This equation is used in objective tests, and it has been applied to calculate the difficulty of items in the achievement test.

$$\text{Difficulty factor} = \frac{n\,p + n\,d}{2n}$$ (Odeh, 1999: 289)

3- Discrimination equation for paragraphs

It was used to calculate the discriminatory power of the achievement test items

$$\text{Discriminatory power} = \frac{P.A - P.D}{(A+D)}$$

(Al-Nabhan, 2004: 199)

4- Effectiveness of incorrect alternatives: It was used to calculate the effectiveness of incorrect (wrong) alternatives for the test items

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$$\text{Effectiveness of alternatives} = \frac{\text{NAM - NDM}}{\text{n}}$$

(Al-Azzawi, 2008: 78)

5) Percentage coefficient of agreement (Cooper equation): The percentage agreement coefficient was used to calculate the rate of agreement of the arbitrators on the validity of the behavioral objectives and study plans and the validity of the test items.

$$\text{Percent agreement} = \frac{\text{Number of times agreement}}{\text{Number of times agreement} + \text{Number of times there was disagreement}} \times 100\%$$

(Al-Mufti, 1984: 62)

6) Keuder-Richardson Equation-20:

Used to calculate the reliability coefficient for the test

$$KR20 = \frac{n}{n-1}\left[1 - \frac{\sum pq}{S^2_x}\right]$$

Chapter Four: Presentation and interpretation of the results

First: Presentation of the results

After the researcher completed the research experiment according to the steps she indicated in the previous chapter, she analyzed the results she reached to find out "the effect of the strategy."TLK BASIC CROW in mathematics achievement for middle school students, as well as knowing the significance of the statistical differences between them, then verifying the research hypotheses, and revealing whether the research results support these hypotheses or not.

For the purpose of verifying the null hypothesis which states that:

There is no statistically significant difference at the significance level (0.05) between the average grades of the experimental group students who study according to (the strategyTLK BASIC CROW) and the average scores of the control group students who study according to the usual method in the achievement test.

After correcting the students' answer sheets, the arithmetic mean and variance were calculated for the two groups, as shown in:Table (11): The average score of the experimental group students was (41.4) with a standard deviation of

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(8.93), while the average score of the control group students was (30.80) with a standard deviation of (10.597). Using the t-test for two independent samples, it became clear that the difference between them was Statistically significant at the significance level (0.05), as the calculated T-value was (4.2), which is greater than the tabulated T-value (2).Degrees of freedom (58), and thus the first null hypothesis is rejected, meaning that:

There is a statistically significant difference at the significance level (0.05) between the average grades of the experimental group students who study according to (the strategyTLK BASIC CROW) and the average scores of the control group students who study according to the usual method in the achievement test, in favor of the experimental group.

Table (4) The significance of the difference between the average scores of the achievement test for students in the two groups (experimental and control)

The significance atlevel 0.05	T value		Degree of freedom	standard deviation	Arithmetic mean	the sample	the group
Statistically significant	Tabulation	Calculated					
	2	4.2	58	8.93	41.4	30	Experimental
				10.597	30.80	30	Female officer

Second: Interpretation of the results

This strategy encourages students to develop problem-solving skills and make decisions on their own, and gives them the opportunity to express their ideas, which contributes to improving their study habits and organizing their thinking, perception, and mental processes, and thus leads to raising their intellectual and academic level.

This strategy's emphasis on evaluation and feedback methods contributes to increasing student achievement in the experimental group. For example, in mathematics, providing students with immediate feedback on their performance

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is among the most powerful forms of feedback, as students receive immediate knowledge of the correctness of their answers, which contributes to enhanced learning. One of the best types of reinforcement for adult learners is to use positive phrases such as "Well done" to reinforce correct behaviors and encourage continued learning.

Third: Conclusions Based on the above, the researcher can summarize her findings as follows:

- Positive impact strategyTLK BASIC CROW as a teaching method in increasing students' achievement in mathematics compared to the usual method among second-year intermediate students.
- Strategic contributionTLK BASIC CROW helps attract students' attention and draw them to the required scientific material and follow up on its requirements through their knowledge of the results of their responses (feedback).

Fourth: Recommendations: The necessity of using educational models in teaching and teaching mathematics, especially strategyTLK BASIC CROW educational program, which has been proven effective through this current research.

Fifth: Proposals: The researcher proposes to complete her study by conducting the following studies:

1- Conduct a study similar to this study on other academic levels in mathematics.

- Conducting a study similar to this study with other variables that were not addressed in this study, such as (attitudes, ability to solve problems, developing curiosity).

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