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Research Article

Analytical thinking and its relationship to academic achievement among fourth-grade students in physics

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Abstract

Targeting the current research to identify the analytical thinking of fourth grade students in science in physics, and the relationship between analytical thinking skills and the academic achievement of fourth grade students in physics. (34) Paragraphs, and after checking the psychometric properties of the two tools, they were applied to a sample of (200) male and female students who were randomly selected. The results showed that fourth-grade students have a good level of analytical thinking and academic achievement, and that there is a direct correlation between the two variables among the research students .

Keywords: Analytical thinking, academic achievement.

Introduction

First: the research problem

Students' possession of analytical thinking has become a concern for educators for its importance to the individual and society, as it enables students to see things clearly, develop creative problem-solving skills, and leads them to generate new ideas after transcending traditional thinking patterns. , so students need time to think, realize and understand all this to change their behavior patterns. (Jaber, 2008: 255)

The researchers sought, through their modest experience in teaching, a clear decline in the level of thinking and its various patterns, especially in analytical thinking, and that teachers often explain the interpretation without paying attention to intellectual questions and cognitive activities that require careful study. and thinking, giving the student a positive role to practice thinking. This was confirmed by local studies, including the study (Al-Jubouri, 2020). Noting that the researchers asked questions through a questionnaire to a number of physics teachers affiliated with the Diwaniyah Education Directorate (12) teachers for the purpose of inquiring about: What is the reality of physics teaching and the level of students' knowledge of it? He is. She? And the extent of their knowledge and interest in analytical thinking skills, and does this affect the achievement of their students?

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After determining and discussing their answers to the questions posed with them, it was found that 90% of teachers had no prior knowledge of analytical thinking skills, did not measure it with their students, and they measured it. Don't use it to manipulate physics. It was also found that 70% of teachers are dissatisfied. At the level of achievement of fourth-grade students in physics. In addition, many local studies, including the study (Mortaza, 2020), the study (Alawi, 2020), and the study (Hadi, 2021), showed a weak and low level of students' achievement in physics in general and the fourth. Scientific. The degree in particular, and this is what the current study has obtained of great importance, which may contribute to raising the level of the learner's competence in facing daily situations and the ability to solve them through analytical thinking, and may also lead to an improvement in the students' level of thinking. The skills that the researcher hopes will contribute to increasing their educational attainment. All this led to a feeling and a sense of the research problem, which can be formulated as follows: (Is there a correlation between analytical thinking skills and the academic achievement of fourth-grade students in physics?).

Second, Importance of the Research

The importance of the current research can be summarized in the following points:

1. The study of two important variables related to the student's personality (achievement and analytical thinking) increases theoretical knowledge, and is a new scientific addition in the educational field in terms of developing the student's ability to the skill of effective thinking.
2. In terms of its variables, this research is in line with the concerns of the Ministry of Education in Iraq and educators in the necessity of teaching thinking and its skills, including analytical thinking.
3. The current research can be concerned with providing a theoretical framework for the search variables to be added to the local and Arab libraries.
4. Providing those who teach physics with accurate and objective measurement tools to measure analytical thinking and academic achievement.
5. This research deals with the preparatory stage, which represents one of the important and sensitive stages in the lives of individuals, which has a clear impact on building the student's personality and preparing him for the university stage.

Third: Research Objective

The current research aims to identify:

1. Analytical thinking for fourth-grade students in physics
2. Analytical thinking for fourth grade students in Physics
3. The correlation relationship between analytical thinking skills and academic achievement for fourth-grade students in physics
4. The correlation relationship between analytical thinking skills and academic achievement for fourth-grade students in Physics in

Fourth/ Research Limits

The current search is determined by:

- First - the spatial boundary: the government secondary and preparatory day schools affiliated to the Directorate of Education in the Qadisiyah Center.
- The second human limit: fourth-grade students and students in science
- Third - Limits of Knowledge: Chapters Two, Three and Five of the Fourth Grade Physics Book * Tenth Edition and approved by the Iraqi Ministry of Education, General Directorate of Curricula and Books for the academic year 2020-2021
- Fourth - Deadline: First session of the academic year 2020-2021

Sixth: Determination of Terms

Analytical thinking - Analytical thinking - defined it (Al-Ayasra, 2011) as a series of mental activities that the brain performs when exposed to a specific stimulus, and it is a pattern of thinking patterns in which the individual divides the educational material into sub-parts. - cutting. The secondary parts are able to perceive the relationships between them, which helps him to understand their structure and structure and work to organize them at a later stage. (Al-Ayasra, 2011: 190) The researcher adopts: The definition of (Al-Ayasra, 2011) theoretically corresponds to the requirements of his research, which the researcher determined procedurally: mental ability is what enables students to study the problem. , its ideas, its parts, and breaking it down into smaller sub-components, which leads to a greater understanding of the parts of the problem, and thus the ability to perform other operations, as measured by the degree to which students get it through the answer. Elements of an analytic inference test. Prepared by the researcher, the group's achievements (Abu Gedo, 2005) were defined as the ingenious process by which the student's mastery in the subjects given to him is determined, and can be used to improve learning methods and planning quality. (Abu Gedo 2005: 411) The researcher adopts the definition of (Abu Gedo 2005) theoretically in line with the requirements of his research. Procedural definition: the total number of fourth grade students (research sample).) acquired in terms of facts, laws, principles, theories and scientific concepts in physics as a result of passing classroom educational learning experiences for the previous stages, and it is measured by the scores obtained by students in the achievement test. Prepared by the researcher for this purpose.

Theoretical Background

Analytical Thinking

Analytical thinking is the individual's ability to identify a problem or idea and analyze it into its parts, elements or partial components, and his ability to organize the information necessary to make an appropriate decision or make a judgment and build a specific standard for the purpose of evaluation and conclusion. Analytical thinking is one of the modes of thinking that first appeared in the writings of the thinker Descartes. Through his model, which formed the core of modern scientific thought, he shows the possibility of a complete understanding of the subject by knowing the properties of its parts. Analysis is isolating something from others to understand it. Parts analysis cannot continue unless they are reduced to smaller parts. (Atiya, 2015, 138), it is “a cognitive method for learners who spend more time thinking, examining hypotheses and evaluating their solutions or responses before they are announced.” Kagan, 1971, 3)) Analytical thinking is one of the most complex cognitive activities, which results from the ability of a person to break down or analyze a problem into smaller parts that an individual encounters in different aspects of his life. It is a cognitive activity that refers to internal processes such as the process of processing information. (Nashwati, 1985, 451) By following the first roots of

analytical thinking, we find that the first reference to analytical thinking appeared in the writings of the thinker Descartes, where he showed that it is possible to fully understand a thing by recognizing its properties of its parts. Analyzing means isolating something from others to understand it. It is not possible to continue to analyze the parts only by reducing them to smaller ones. (Frithoff, 1998, 85) Analytical thinking is defined as a mental skill that requires the ability to break down situations, objects, and relationships into their components (Touq and others, 2003, 80). Parts (such as classification, arrangement, and organization) (Al-Atoum, 2012) are defined as the ability to disassemble the parts of a thing and know its elements. (Al-Atoum, 2012, 195) (Royce) indicated that the thinker (Krikori) is the first theorist in analytical thinking, and this view was referred to in a number of researchers' books, namely (Stern Burke), Saadeh, Qatami. Although no theory categorized as actually existing, several studies, including Stern Burke and Gregory, aimed at defining control theory and a scale called Gregory 1988, which measures patterns of mind, shows the personality of an individual who thinks analytically, including: That analyze situations, focus on data, check numbers and provide a feasibility study for expected results. A mind that is aware of situations, is reflective and realistic, is good at solving problems, excels at making money, is assertive in its decisions, as it relates to insight and reasoning, and distinguishes Easily interacts with people, realizes their nature, loves to collect football, analyzes issues, and provides evidence of it Attracts the attention of others and has the ability to assess situations People are unfit to work in certain jobs and professions, including painting, nursing, essay writing as a reporter, directing a television program, and a personable person His library is organized with a scattering of papers; he prefers practical tools and equipment, is not inclined to extravagance, and has a discreet personal appearance). Among his shortcomings (rigidity with some cruelty, he takes into accounts everything and needs evidence and proof when presenting his ideas) Krikori bases these characteristics on Sternberg's theory of mental control. (Idris, 2010, 84)

Stages of Analytical Thinking

Dewey formulated the method of analytical thinking according to brief stages as follows:

1. The existence of a problem facing the individual and prompting him to carry out the necessary activities for the solution.
2. Observation and observation to gather the necessary information about the problem to understand and analyze it.
3. Putting hypotheses after collecting information and realizing the problem and analyzing it.
4. Achieving these hypotheses and proving them with other information and previous experiences of the individual.
5. Access to final results and general rules and regulations. (Al-Qatami, 1990: 558).

Assumptions of Analytical Thinking

A number of assumptions underpinning analytical thinking can be identified:

1. Thinking is an active mental process in which the individual is aware and preoccupied with what he is facing and aims to overcome the problem and thus is active.
2. Thinking includes sequential, sequential and regular mental processes that proceed according to a pattern, and not fluctuating random processes, such as trial and error processes.

3. Analytical thinking requires the individual to recall past experiences that relate to the most mature situation and are most relevant to the problematic situation he faces.
4. Analytical thinking is of a pivotal nature, that is, all mental activities focus on the problematic situation to understand its nature, elements and factors affecting it. (Al-Qatami et al., 2000, 678)

The importance of successful analytical thinking

Students' use of a successful analytical thinking process provides:

1. Independent and effective learning to better communicate the topics at hand.
2. The opportunity to develop communication capabilities and employ comprehension and evaluation skills.
3. Using the skills of analysis, evaluation, solving life problems, making decisions and presenting topics effectively.
4. Adequate opportunity to read, understand and analyze the situation.
5. To think clearly about the principles and applications of language, regardless of the symbols in it.
6. Experience in verbal exploration, evaluation, and communicating information to organize, edit, and evaluate ideas.
7. The ability to achieve goals and limitations when applying analytical skills.
8. Collecting, organizing, following up and evaluating information during the learning process.
9. The ability to use and use information in different learning situations.

(Amer, 2005, 62), (Al-Dardeer 2004, 279).

Analytical thinking skills

1. Defining features or features: i.e. the ability to specify the general features of several things, or the ability to derive a comprehensive description.
2. Characteristics: the ability to identify the name, surname, and common features of a particular thing or individual.
3. Monitoring procedures: the ability to choose appropriate features, tools, and procedures that guide and assist in the process of collecting information.
4. Differentiating between similar and different: the ability to identify similarities and differences between some topics, ideas or events, or to identify similar and different things within a specific field.
5. Compare and contrast: that is, the ability to compare two things, two people, two ideas, or more from several angles.
6. Grouping / Tabulation: The ability to classify similar objects or items into a group based on the basic attributes or properties that were created earlier.
7. Classification: The ability to categorize, organize and put information into groups
8. Building criteria: that is, the ability to identify and evaluate the most useful criteria that can be used in evaluating items or items for their importance.
9. Arranging and prioritizing and hierarchical work: The ability to place items or events in a hierarchy based on qualitative values or the order of certain events in time.

10. Relationship vision: the ability to compare ideas and events to determine the order between two or more processes
11. Guess / anticipate / anticipate: i.e. the ability to use model knowledge, compare, contrast and specific relationships in determining or anticipating similar events in the future.
12. Determining cause and effect: that is, the ability to identify the most important and strongest causes or consequences of previous actions and events.
13. Measurement: The ability to identify relationships between familiar items or events, and similar items and events in new situations for the purpose of problem solving or creative production.

(Strenberg, 1998: 120 (Abdul-Hadi, 9, 2003)

Research methodology and procedures Procedures of Research

First, Research Methodology:

In the current research, the descriptive approach was used. This is due to its relevance to the objectives and nature of the research.

Second: the research community: The research community was identified by the fourth scientific grade students in the government preparatory and secondary day schools affiliated to the center of Al-Diwaniyah Governorate for the academic year (2020 - 2021 AD), and they numbered 4235 students, and were distributed among (33) schools.

Third, the simple search form: The researcher resorted to choosing a random sampling method for the final application, consisting of (200) male and female students, at a rate of (100) for both males and females, to conduct the final application of the research.

Fourth: Research tools: Analytical Thinking Test in Physics: Repeat the test according to the following steps:

- Determine the purpose of the test: The objective was to measure the analytical thinking of fourth-grade science students in middle and high schools.
- Defining Analytical Thinking Skills: Analytical thinking skills were determined after reviewing the literature and previous studies such as Al-Jubouri's study, and it was found that they share the researcher's set of skills, which is (the skill of identifying qualities or traits). Description skill Observation skill The ability to distinguish between comparison skill and similar and different interview skills The skill of grouping / categorizing the scheduling skill The skill of building standard skills The skill of arranging, setting priorities and making sequences The ability to see relationships The skill of guessing / forecasting / predicting The skill of determining the skill of measuring reason and the result) (Sterenberg, 1998: 120 (Abdul Hadi, 2009, 33)
- Drafting test items the items for the Analytical Reasoning Test are designed according to the students' level of clarity and ease of language. The test consists of (39) objective paragraphs distributed over (13) skills and (3) paragraphs for each skill.
- Instructions for answering the test items: I provided a set of instructions that included general information about the student and the way to respond to the paragraphs, as well as a statement of the answer to all the researcher's paragraphs and not to leave any paragraph unanswered, and the time allotted to answer.

- Correction of test items: The total score for the test ranged from (zero - 39).
- Application of the first survey: The researchers applied the test on Sunday 20/12/2020 on an exploratory sample consisting of (30) male and (15) female students, and after answering, it was found that the instructions are clear in the paragraphs. It is possible to understand the average time taken to answer the test items (50) minutes.
- Second survey request: The test was applied for the second time on a statistical analysis sample of (100) male and female students of (50) male and female students on Sunday and Monday corresponding to 27-28/12/2020 to verify the psychometric measurement. Features.
- The validity of the test: It is related to two types: Apparent honesty: To achieve this, the test was presented to a group of experts and specialists in the field of science teaching, methods of measurement and evaluation, supervisors and specialized teachers to prove the validity of the test items and their suitability for the skill. in question, and some paragraphs have been modified accordingly. The validity of the construction (the internal consistency of the test): The researchers intended to do this by examining the test paragraphs by applying to the sample of statistical analysis, to extract the statistical indicators through which we conclude that the test construction was characterized by the honesty paragraphs of acceptable honesty, and to verify the above, the researcher performed the following procedures
- Paragraph difficulty factor The difficulty equation was applied, and the results showed that all test items were of medium difficulty, as it ranged between (0.35 - 0.54), and thus the number of test items became (39).Discriminatory Power Clauses The item discrimination power equation was used and it was found that the test item discrimination power ranged between (30% and 85%) and thus the number of test items became (39) items. The effectiveness of the wrong alternatives to the paragraph: After applying the alternatives effectiveness equation to the test items, the results showed that the alternatives attracted more students in the lower group than students in the higher group.
- Stability test: The internal consistency method was implemented by the Kewder Richardson 20 method (Kuder - Richardson Formulas 20), and depending on the results of this method, the test has high reliability, where the reliability coefficient is good if its value is not less than (0.67) (Al Nabhan, 2004: 240).

Second: the achievement test Achievement test

The following is an explanation of the steps for preparing for the achievement test:

1. Determining the objective of the test: The achievement test aims to measure the achievement of fourth-grade students in physics for the three chapters specified in the current research.
2. Determining the number of test items: The researcher relied on the fact that the test includes (34) items from multiple-choice objective tests.
3. Preparation of specification table (test map)

Preparing a specification table that includes the topics of the three chapters (second, third and fifth) of the fourth grade physics book and the behavioral objectives of the levels (remember, understand, apply, analyze, construct, and evaluate) inside it. The cognitive domain of Bloom's

taxonomy was calculated, and the content weights of the subjects were calculated in light of the number of pages. The three chapters were as follows:-

الفصول	عدد حصص	الأهمية النسبية	النسبة المئوية للأهداف السلوكية					المجموع
			التذكر	الاستيعاب	التطبيق	التحليل	التركيب	التقويم	%100
			%30	%23	%11	%6	%24	%6	
الثاني	6	%29	3	2	1	1	2	1	10
الثالث	9	%42	4	3	2	1	3	1	14
الخامس	6	%29	3	2	1	1	2	1	10
المجموع	21	%100	10	7	4	3	7	3	34

Table ( ) Test Map

4. Drafting of test items: (34) items were formulated and distributed on the content of the scientific material and covering the behavioral purposes, and each item contains four alternatives.
5. Test correction: The researcher relied on the correction to give one mark for the correct answer and zero for the wrong answer, and thus the final score of the test became between zero as a minimum (34) as a maximum.
6. Drafting the instructions for answering the test: The researcher formulated the instructions for the test and how to answer them so that they are clear to students and include student information and the distribution of grades on the paragraphs.
7. Validity of the test: The researcher seeks to verify two types of validity:

A- Apparent honesty: the honesty aspect: The grade presentation test is based on behavioral purposes measured by its paragraphs on a group of arbitrators and experts from the methods of teaching physics, measurement and evaluation, and the competence of physics teachers and subject supervisors, to the extent of the validity of the material. Paragraphs and their representation of behavioral purposes.

B - Credibility of content: The researcher worked on preparing the elements of the achievement test according to the specification table, which is one of the indicators of content validity.

8- The exploratory application of the test was in two stages: The first exploratory application: the two researchers applied the test to an exploratory sample of (30) male and female students, (15) for each male and female, and the students' response time was (40) minutes.

• The second exploratory application: After ensuring the clarity of the test and its instructions, the test was applied a second time on the sample of statistical analysis consisting of (100) male and female students, at a rate of (50) male and female students. Both females and males are divided among (50) fourth-grade science students, on Sundays and Mondays. Corresponding to December 27-28, 2020. Each of:

A. Paragraph difficulty coefficient: The difficulty coefficient was calculated for each test item and found that it ranges between (0.35 - 0.50) and this means that the test items are acceptable and the difficulty coefficient is appropriate.
B. Paragraph discrimination coefficient: It was found ranging between (0.41-0.78), and the paragraph can be considered acceptable if its discrimination coefficient is (20,0) and above. (Al-Ajili et al., 71: 2001)
C. The effectiveness of the wrong alternatives: The effectiveness of the wrong alternatives was calculated and found to range between (0.04 and -0.48), which means that the wrong alternatives have attracted a number of students in the lower largest group. of the number of students in the upper group, and therefore it was decided to keep the wrong alternatives unchanged.

9- The stability of the test: the researcher used in calculating the stability of the achievement test, the split half, and this stability coefficient after correction was (0.94), and he also used the Quaider-Richardson coefficient (20) to calculate the stability of the achievement test, where its value was (0.94), which is a stability coefficient. High.

Fifth: Application of the two research tools: The two tests were conducted during the end of the first course exams on (Tuesday) 30/3/2021, and after applying the two tests, the students' answers were corrected. According to the answer form (correction key), and they were put into tables for statistical processing.

Sixth: Statistical Means: The researchers used the appropriate statistical means in processing the research data, building research tools and extracting its results through the SPSS statistical portfolio and the Excel program.

Presentation and discussion of the results

First, display the results

The first objective: to identify the analytical thinking of fourth-grade students in science in physics It was shown from the table 2 that the members of the research sample have a good level of analytical thinking compared to the hypothetical average of the test .

Table 2 the results of the T-test of the analytical thinking test for students of the fourth scientific grade

Indication level 0.05	T value		hypothetical mean	standard deviation	SMA	the sample	variable
	tabular	calculated					
Statistical function	1,99	9,83	26	6,54	30,55	100	Analytical thinking

The second objective: to identify the analytical thinking of the fourth-grade students in science in physics

The table 3 indicates that the students of the fourth scientific grade have good analytical thinking because the calculated average is higher than the hypothetical mean.

Table 3 the results of the T-test of the analytical thinking test for the fourth-grade scientific female students

Indication level 0.05	T value		hypothetical mean	standard deviation	SMA	the sample	variable
	tabular	calculated					
Statistical function	1,99	10,33	26	7,62	31,57	100	Analytical thinking

The third objective: the correlation between analytical thinking and academic achievement among fourth-grade students in science in physics.

The result indicates that there is a direct correlation between these two variables among the students of the research sample .The table 4 illustrates this

Table 4 Correlational relationship between analytical thinking and academic achievement among students of the fourth scientific grade

Significance level0.05	T value			The value of the correlation coefficient between analytical thinking and achievement	The value of the correlation coefficient between analytical thinking skills and achievement	Analytical thinking skills	number of people	variable
	tabular	Calculate	calculated					
function	1,99	56,75	27,067	0,264	0,187	Define traits or traits	100	
function	1,99	56,77			0,116	Define properties	100	
function	1,99	56,72			0,160	take note	100	
function	1,99	56,76			0,207	Distinguish between similar and different	100	
function	1,99	57,43			0.151	Compare and contrast	100	
function	1,99	57,14			0,234	Grouping and tabulation	100	
function	1,99	56,73			0,167	Category	100	
function	1,99	57,84			0,219	building standard	100	
function	1,99	56,96			0,197	Arranging, prioritizing,	100	

Significance level0.05	T value			The value of the correlation coefficient between analytical thinking and achievement	The value of the correlation coefficient between analytical thinking skills and achievement	Analytical thinking skills	number of people	variable
	tabular	Calculate	calculated					
						and making sequences		
function	1,99	56,74			0,130	relationship vision	100	
function	1,99	57,34			0.135	Guessing and Prediction	100	
function	1,99	57,14			0,234	Identify insults and Allen v Liege	100	
function	1,99	56,76			0,110	make a measurement	100	

Fourth Objective: The correlation between analytical thinking and academic achievement of fourth-grade students in science in physics .It indicates the result of the table () to a correlation between these two variables proportional to the sample students Search

Table 5 Correlational relationship between analytical thinking and academic achievement among fourth-grade students of science

Significance level0.05	T value			The value of the correlation coefficient between analytical thinking and achievement	The value of the correlation coefficient between analytical thinking skills and achievement	Analytical thinking skills	number of people	variable
	tabular	Calculate	calculated					
function	1,99	38,807			0.252	Define traits or traits	100	
function	1,99	39,062			0,292	Define properties	100	
function	1,99	38,823			0,235	take note	100	
function	1,99	38,801	20,710	0,329	0,262	Distinguish between similar and different	100	
function	1,99	39,191			0,309	Compare and contrast	100	
function	1,99	38,861			0,220	Grouping and	100	

Significance level0.05	T value			The value of the correlation coefficient between analytical thinking and achievement	The value of the correlation coefficient between analytical thinking skills and achievement	Analytical thinking skills	number of people	variable
	tabular	Calculate	calculated			tabulation		
function	1,99	38,839			0.253	Category	100	
function	1,99	38,845			0,208	building standard	100	
function	1,99	39,164			0,322	Arranging, prioritizing, and making sequences	100	
function	1,99	38,855			0,271	relationship vision	100	
function	1,99	39,087			0,277	Guessing and Prediction	100	
function	1,99	38,845			0,203	Identify insults and Allen v Liege	100	
function	1,99	39,112			0,235	make a measurement	100	

Second: Discussion and Interpretation of the Results

The results showed that fourth-grade science students (males and females) have analytical thinking in physics at the level of Dr. It is believed that this age group of young people have the drive and interaction with reality as well as their sense of responsibility. As they are able to analyze the challenges and situations they face by various available means, whether in or outside the school and what also helped them in this aspect is the modern technological means of various kinds, which had a clear impact in providing appropriate alternatives. Hence the growth of their mental abilities, including analytical thinking. The researcher believes that the students' various thinking skills, including analytical thinking skills, occur through his involvement in educational activities, which interacts with him with the problem or situation that is the subject of the lesson, which leads him to devise ways to deal with the subject, and present new possibilities, ideas and results To remedy this educational situation. As they have the ability to analyze stimuli into separate parts to facilitate dealing with them, and then think about those parts independently and analyze the details of situations in their detailed parts to find appropriate solutions, and this has been confirmed by many studies such as the study (Abdul-Ilah 2019) and the study (Madeed 2020). . As for the correlation between analytical thinking and academic achievement among fourth-grade students in physics. The results indicated that there is a direct correlation between these two variables for students of the fourth scientific grade, that is, the greater the learner's skills in analytical thinking, the greater his ability to study his subject, and thus the higher his academic achievement. The characteristics of researchers the positive relationship between the

two variables of the nature of the fourth-grade physics presentation in an organized manner and associated with learning analytical thinking skills that helped to develop learning at all levels. As enabling students to find the useful link between the analytical thinking skill and its application in various daily activities, including achievement and this gives the learner a sense of conscious control over his thinking, which is reflected in improving his performance and sense of self. Confidence in facing school and life tasks and problems. (Al-Kubaisi, 2007: 25) These results are consistent with the theoretical framework adopted in this research, where students who have the ability to analyze situations, understand sequence and sequence, and predict outcomes are characterized by a high level of achievement. As their ability to think analytically means the ability to segment the topic and understand it better, and this leads to a series of investigation, examination and integrated analysis, and then contributes to understanding the scientific material and increasing success rates. Asking questions that require deep thinking and linking the educational material to the surrounding environment by giving examples of different physical phenomena and using similes helped in forming their self-confidence and then increasing their motivation to learn and their interaction in a positive way, and this is what was agreed upon with the study (Al-Jubouri, 2020).

Third: Conclusions: Based on the results of the current research, the following conclusions were reached:

1. Fourth-grade students (males - females) have the ability to think analytically due to their age and the nature of their studies.
2. There is a direct correlation between analytical thinking and academic achievement among fourth-grade students in physics.

Fourth: Recommendations: In light of the research results, the researcher recommends helping students and encouraging them to use analytical thinking skills in facing the situations and problems they face in their academic and daily lives.

Fifth: Suggestions: a research topic to be completed with a proposal to conduct studies to build proposed units according to analytical thinking skills, and their effectiveness compared to the units approved in the curricula.

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