

THE SCIENTIFIC CURIOSITY AMONG OF THE FOURTH PREPARATORY STUDENTS IN BIOLOGY IN THE CENTER OF AL-QADISIYAH GOVERNORATE

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Abstract

The current research aims to Identify the level of scientific curiosity among middle school students in biology and to know the statistically significant difference in scientific curiosity according to the gender variable (males – females) among middle school students in the center of Al-Qadisiyah Governorate. The current research was limited to a sample consisting of (150 (80) male and female students (81) males / (69) females In the governmental day schools affiliated to the Directorate of Education of Diwaniyah from the morning study, and for the academic year (2022-2021), they were chosen by the Intentional method, and on the basis of proportional distribution. The researcher used the descriptive research method, and to achieve a goal The research prepared the researcher, the first tool (scale of scientific curiosity), which is in its final form of (20) paragraphs distributed evenly on each field (5) paragraphs. And the discriminating powers of Its paragraphs and calculating Its stability using the method of internal consistency (alpha-Cronbach coefficient), as the stability coefficient reached (0.77), and the psychometric properties of the paragraphs of the scale were confirmed to be ready for the final application, and the statistical bag for sciences was used Social (SPSS)) in the processing of data, and the research found the presence of:

1-Students have a good scientific curiosity

2-There is a statistically significant difference in (scientific curiosity) in favor of males over females.

Keywords: scientific curiosity-Visual intelligence and Its relationship to cognitive preference in Science among middle school students.

Introduction

First: Problem of the Research

The rapid developments that the world is witnessing in all fields, both scientific and social, have produced many challenges, and because of that development, which worked to stimulate research skills, exploration and scientific curiosity, which is considered a basic goal and a prominent feature of developed societies, especially in science, and this in itself imposes on specialists in this field the development. This is a kind of curiosity among students, depending on the scientific approach to biology, which contains pictures and practical experiments that raise the scientific level for the sake of continuous development. Through what the researcher touched with his modest experience of (10) years in teaching, especially science, there is a weakness in scientific curiosity, and if it exists, it is little. This was confirmed by a number of science teachers who have an experience of not less than (5) years in the field of teaching and supervisors of specialization in science, whom the researcher contacted by submitting a questionnaire to them, so their answers confirmed their lack of knowledge and previous hearing of the concept of scientific curiosity. They also confirmed, through the questionnaire provided to them, that they are not satisfied with the level of scientific curiosity among the fourth grade preparatory students.

Second: the basic Importance of the study

The importance of the current study can be summed up in the following points: It is considered the first local research (as far as the researcher knows) to deal with the variable of scientific curiosity in the preparatory stage. The research is determined by the importance of the target group as an important stage in building the student and developing his needs, inclinations and abilities through the practical side. The importance of recognizing scientific curiosity among students may contribute to taking into account individual differences among students. It highlights the importance of scientific curiosity as one of the skills of the twenty-first century and deals with higher skills, which gives an understanding of cognitive information and the completion of the mental image in the textbook and linking what they learn in practical life and even the environment. Those in charge of the curricula, supervisors, and specialists may benefit by holding seminars, courses, and workshops, or submitting recommendations that include scientific curiosity.

Third: Research Goals

The current research aims to:

1-Identifying the level of scientific curiosity among middle school students

The statistically significant difference in scientific curiosity according to the gender variable, females – males among middle school students.2-

Fourth: Limitation of the Research

The current research is limited to:

1-Pupils of the fourth grade of middle school In Al-Jumhuriya Preparatory School for Boys and Maysaloun Preparatory School for Girls affiliated to the General Directorate of Education of Diwaniyah / Center

2-The academic year (2021-2022 AD

Fifth: Definition of The Terminology

1-Scientific curiosity

Grossnickle (2014) referred to in (Al-Jubouri and Creedy, 2016) defines curiosity as “the cognitive mental desire to obtain information, as a result of exposure to experience, new variables, or stimuli characterized by novelty, ambiguity, and excitement, which are accompanied by the formation of an Increase in excitement and the desire to activate behavior.” The Learner's Exploratory (8, 2014, Grossnickle). (Al-Zayyat, 2004) mentioned In (Al-Jubouri and Creedy, 2016) defines curiosity as an Innate motive that stimulates activity for the student with the aim of satisfying this motive and reducing the level of tension that occurs due to not satisfying scientific curiosity or Is the continuous and intense desire to discover and understand natural and scientific phenomena, and to explore the world around us In an active and open-minded manner. Scientific curiosity Is considered one of the skills of the twenty-first century. This era Is characterized by rapid changes, which would require a kind of individuals who possess the basic and crisis skills to deal with Its challenges and data, and through it the student can face these changes. The deep work that stimulates research and investigation through the experiences of students (Al-Jubouri and Creedy, 136, 2016).

Al-Azwani, 2013, referred to In Farhan (2022), sees that scientific curiosity has an Important role In helping the student to acquire knowledge, as it Is a motivation and drive for the mind towards questioning and investigation, and it is considered an aspect of innovation among students. The student who has high curiosity asks, discusses, and participates effectively It presents Ideas and what is going on In his mind, unlike the weak or low scientific curiosity, and increases the level of achievement among curious students. It develops the student's self-confidence and makes him dependent on himself, and thus develops self-learning and relies on himself In all his scientific and practical matters, as well as increasing the cultural and cognitive attainment that the learner possesses and the stored experiences that make him a curious person and a searcher for information and keeping pace with everything that is modern and useful In light of the acceleration of information and scientific developments. Scientific controversy and glowing scientific curiosity (Farhan, 197, 2022)

Scientific curiosity has many fields? Including Balati

1-Scientific modernity (for Jeddah): it Is the stimuli that seem new to the student's experience and he has not been exposed to it before, and It is directly related to the environment, whether the social, academic or social environment for him) (Abu Kamil, 215, 2018)

2-Complexity: is the response to stimuli that are complex and complex in their composition and forms, which prompts the student to solve that or pay attention to that complexity and composition by searching for and knowing It (Hassan, 26, 2013)

3- Contradiction: the stimulus that consists of elements that are inconsistent and heterogeneous in relation to the student's experience (Friday, 14, 2016) for ambiguity: and indicates that something happened unexpectedly, which calls for wonder and confusion and leads to excitement (Abu Kamil, 215, 2018)

4-Ambiguity: It refers to the occurrence of something unexpectedly, which calls for wonder and confusion and leads to excitement (Abu Kamil, 215, 2018) (Farhan, 202, 2022).

Scientific curiosity is of great importance in the life of the student and society, and the most important of them

1- Promoting creativity and innovation: Scientific curiosity stimulates the individual to think creatively and generate new ideas and innovations in many fields, and thus helps in developing and improving daily life and facing modern challenges.

2-Developing scientific and technical skills: Scientific curiosity helps develop individual skills in analysis, critical thinking, research, experimentation and exploration, and thus stimulates continuous learning and professional development

3-Improving mental and physical health: scientific curiosity helps improve mental and physical health, as it encourages mental and physical activity and helps relieve stress and improve emotionally

4-Promoting social interaction: Scientific curiosity helps develop communication skills and social interaction, as it encourages cooperation and interaction with others and sharing knowledge and experiences

5- Improving personal and social decisions: scientific curiosity helps improve the individual's ability to make correct and responsible personal and social decisions, as it helps to understand the surrounding phenomena and problems and to think critically about solving them

6-Building an open mental structure: where the student asks scientific questions and deals flexibly with new problems and situations, and thus he can transfer what he learns to his environment, which contributes to the development of himself and society (Al-Khalidi, 846, 2020)

Qualities (student) Inquisitive perhaps the most prominent

1-Curiosity: Where the curious individual enjoys the love of exploration, learning, and the search for new knowledge. And skills such as self-learning skills

2-Interest: the curious individual pays great attention to details and is keen to know everything related to the subject he is interested in. It encourages pupils' interest and stimulates their attention and curiosity. (Rifai, 2012: 63).

3-Mental curiosity: the curious individual is characterized by the ability to think critically, analytically and innovate

4-Independence: the curious individual prefers to work independently, learn and explore on his own

5-Patience: the curious individual is characterized by patience and endurance in the research, learning and experimental process.

6-Eagerness to improve: the curious individual always strives to improve ideas, creations, and innovations, and is keen to continuously develop himself.

7- Determination: Where the inquisitive individual is characterized by determination and determination to achieve his scientific and educational goals. It also prepares him for self-reliance, so he becomes ready to organize his life and plan for the future.

8-Social curiosity: Where the curious individual is keen to communicate with others, share knowledge and experiences, and exchange ideas and opinions, It provides students with a rich and challenging environment that stimulates thinking, active and positive participation in them, and enriches their experiences and scientific curiosity. (Khairy, 2018: 32)

The second chapter: (theoretical framework and previous studies)

The first axis

Theories that explained scientific curiosity

1- The "knowledge need" theory: It explains scientific curiosity as a kind of basic human need, whereby curiosity works to meet these needs and achieve self-satisfaction

The "self-freedom" theory: It interprets scientific curiosity as a result of man's need to expand the scope of his own freedom and liberate him from mental and social constraints.2-

3-The theory of "active exploration": it focuses on the curiosity that drives man to seek knowledge and learn through active exploration of the world around him

4- The "Positive Curiosity" Theory: It considers scientific curiosity to be one of the positive and useful qualities, and stresses that curiosity helps a person Improve his mental, social and Interactive skills, and enhances creativity and innovation

5-The "dual theory of curiosity" theory: This theory considers that scientific curiosity consists of two aspects, the internal aspect which Is the need for discovery, learning and self-discovery

Arnone, 2003 and Ibrahim, 2013 showed that the most important of these theories Is the Maw-Maw theory (MaW-MaW). New, strange and different things or concepts In the environment, so he responds to these things with his desire and curiosity to know and explore them starting from the latter, and that curiosity is an event that the student encounters a stimulus and responds to this stimulus In a positive way by heading towards it, discovering It and treating It (Mikael, Ramadan, 443, 2022).

Previous studies of the variable

(Farhan's study, 2022) the study aimed to Identify the level of scientific curiosity among the students – the teacher in the College of Education, and It was found that there is a statistically significant difference depending on the gender variable, as the sample consisted of 150 male and female students, and the researcher built a scale consisting of 4 domains, with a reality 40 paragraphs, and the results showed, after verifying the psychometric characteristics of sincerity and stability In the manner of internal consistency, It was communicated to – every student possesses scientific curiosity to a good degree - that there is a statistically significant difference in favor of females over males.

The third chapter: research methodology and procedures

This chapter deals with the procedures adopted by the researcher to achieve the objectives of the current research, and includes a description of the research community, the method of

selecting the sample, the steps for building its tool, and the appropriate statistical methods for data analysis. The following Is a review of these procedures:

Research methodology: The researcher used the descriptive approach due to Its suitability with the nature of the research objectives, as it Is defined as a form of organized scientific analysis and interpretation to describe a phenomenon or problem and develop It quantitatively by collecting data and standardized information about the phenomenon or problem, classifying it, analyzing it, and subjecting It to careful study. (Imam, 2011: 325).

Research community: The research community consisted of all middle school students In government day schools for the academic year 2021-2022, who numbered (1053), for the purpose of identifying their level of scientific curiosity.

Research sample: The sample Is defined as a part of the community that is withdrawn In some way so that It represents the best representation of the community" (Abdul Rahman, Zangana, 2008: 304). In this research, students of the fourth preparatory grade of Al-Jawahiry School for Boys were deliberately selected, and their number Is (69). male students / and the Damascus School for Girls, which numbered (81) female students for the fourth grade.

Research tool: For the purpose of collecting the necessary data to achieve the objectives of the current research, the researcher prepared a measure of scientific curiosity based on theoretical definitions of the variable and benefiting from previous studies.

The process of building the tools went through the following steps:

1-Determine the purpose of the scale was designed to measure the main objective for which the scale was designed was to measure the scientific curiosity of the students of the middle school stage of biology (for the fourth year of middle school) In the morning schools affiliated to the center of Al-Qadisiyah Governorate for the academic year (2021-2022).

2-Look at previous studies.

3- Determine the areas of the scientific curiosity scale / as the scale consists of four areas, namely.

4-Formulating the items of the scale. The scale, In its initial form, consists of (20) paragraphs with five alternatives (strongly agree-agree-neutral-disagree-strongly disagree) within four areas for each area five paragraphs.

5-Instructions for answering the scale The researcher prepared a set of instructions to explain to the study sample students how to answer the scale items

6-Instructions for correcting the paragraphs of the scale The researcher prepared a set of instructions that specify the method of correcting the paragraphs, which is from (1-2-3-4-5)

7-The validity of the scale

Face Validity

After preparing the instructions and paragraphs of the scientific curiosity scale amounting to (20) paragraphs In its initial form, the researcher presented it to a group of arbitrators and

experts specialized in educational psychology and teaching methods, and to a number of biology teachers who study this subject in the middle and preparatory stages of the academic classes and a number of jurisdiction supervisors

Construct Validity

The relationship of the score of each paragraph to the total score of the test will be calculated after applying the scale reconnaissance

8-Exploratory application of scientific curiosity scale

8- 1- The first survey application

The researcher applied the scale to a sample of (20) female students from Damascus Preparatory School, on Thursday 6/4. The average response to the test items was (39) minutes, by calculating the total time taken for the first five answers, which is (36) minutes and the last five answers. It was (42) minutes divided by (2).

8-2- The second survey application

After the researcher made sure of the scale, Its paragraphs, instructions, and the time required to complete It, the researcher decided to apply It again to a sample consisting of (150) students from the preparatory stage in biology on Thursday (2022/16/4) distributed by (69) students from Al-Jumhuriya Preparatory School for Boys and (81)) A student from Maysaloun Preparatory School for Girls

9-Determine the psychometric characteristics of the scale

9-1 The relationship of the paragraph score with the total score of the test

In order to achieve this procedure or step, correlation coefficients were calculated using the Pearson method to find the relationship of the degree of the paragraph with the total score of the scale by subjecting all the statistical analysis sample forms to this procedure. Thus, all paragraphs are considered acceptable, and the scale has internal consistency

9-2 Power of discrimination for the scale paragraphs

The calculated t-value for some paragraphs of the scale ranged between (0.22-0.51), and accordingly, when comparing the calculated t-value for each paragraph with the tabular t-value of (1.96) at a level of significance (0.05), with a degree of freedom (106). Through this step, it became clear that all items of the scale are statistically significant, which means that all items have the ability to distinguish between the members of the survey sample.

-The degree of each paragraph in the domain to which it belongs: It turned out that all of the (20) Items of the scale belong to Its domains, because the Pearson correlation coefficient values were all statistically significant, because they are greater than the tabular value of the correlation coefficient of (0.13) at Significance level (0.05) and a degree of freedom (198).

- The relationship of the domain to the total degree of the scientific curiosity scale: After extracting the relationship of the paragraph to the total score and the relationship of the paragraph to the field to which it belongs, the researcher resorted to a complementary procedure for the process of Internal consistency of the (scientific curiosity) scale, which Is to extract the consistency of the field as a whole with the total score of the scale based on the responses of the second survey sample and the adult Their number is (150) male and female students. It turns out that all fields follow the same path as the whole scale.

Reliability: The researcher relied on Cronbach's alpha equation for the internal consistency of the scale and the method of re-testing.

Final application of the scale: The scale has been applied In its final form. After extracting the psychometric characteristics and scientific foundations of the (scientific curiosity) scale, the researcher obtained the final form of the If scale consisting of (20) items distributed over four areas, each field (5) paragraphs, correction keys from (1-5) with a fixed response time estimated at (10-10). 20 minutes.

Statistical means: The Statistical Package for Social Science (SPSS) was adopted in the statistical treatments

Chapter Four: Presentation and interpretation of the results

The first objective: to know the extent to which middle school students possess scientific curiosity in biology

(1) Schedule

The results of the t-test for one sample to test the significance of the difference between the arithmetic mean and the hypothetical mean of the respondents' scores on the scientific curiosity scale

Variable	sample	SMA	Standard division	Hypothetical mean	T value of a single sample		indication 0.05
					Calculated	Tabular	
Scientific curiosity	150	30.27	6.53	22.5	27.970	1.98	function

It Is clear from the above table that the arithmetic mean of the sample exceeds the hypothetical mean. When testing the significance of this difference, it was found to be statistically significant at the level (0.05), and this confirms that the research sample has scientific curiosity.

The second objective: Find out the extent to which middle school students have scientific curiosity in biology, depending on the gender variable.

The arithmetic mean and standard deviation of the scores of all sample members were calculated, and after using the t-test equation for one sample to find out the significance of the differences between the arithmetic mean and the hypothetical mean, it was found that there was a statistically significant difference between the mean scores of the sample and the hypothetical mean, meaning that the research sample had scientific curiosity.

(2) Schedule

T-test results for one sample to test the significance of the difference between the arithmetic mean and the hypothetical mean

The scores of the sample members on the scientific curiosity scale

Variable	sex	sample	SMA	Standard division	Hypothetical mean	T value of a single sample		indicati on 0.05
						Calculated	Tabular	
Scientific curiosity	Male	69	128.072	14.222	21	41.53	1.98	Function
	female	81	123.148	14.75				

Through the previous schedule, the statistics difference between females and males In the scientific curiosity measure Is due to male benefit depending on the value -T – calculated – (41,53) greater than: 1.98 at the level of 0.05) The reason for this is the highest level of scientific curiosity to increase their scientific potential, exact research and mutual love and solve problems and preference for the scientific and practical side through the questions made.

CONCLUSIONS:

Through the results reached the following conclusions:

1. Students of the preparatory stage they have scientific curiosity.
2. Students of the preparatory stage have scientific curiosity.

Second: Recommendations: The researcher recommends the following:

- 1-The need to enable students to develop their ability to scientific curiosity and Invest.
2. The establishment of educational seminars and guidance for students for the purpose of improving the level of scientific curiosity.

Third: Proposals: The researcher suggests:

- 1- Conduct similar studies to measure the level of scientific curiosity in other societies and stages (primary, medium).
- 2- Conduct similar studies on scientific curiosity and its relationship with some variables such as social acceptance and academic achievement.

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