The effectiveness of a suggested educational program based on creative problem-solving theory regarding the achievement among fourth grade literary students in geography subject and in developing their serious thinking

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Abstract

The current study aims at finding out (The Effectiveness of Suggested Instructional Program Based on the Theory of Creative Problem Solving on the Achievement of Students of Fourth Literary Stage in Geography and Developing their Serious Thinking). (65) students from the fourth literary class, with (33) students for the experimental group, and (32) students for the control group. The preparation of the program went through four phases (analysis, design, implementation, and evaluation), where the program was planned with all its components (objectives, content, methods and methods, activities, and evaluation tools) in line with the problem-solving theory. It is a multiplex test type with four alternatives to measure the levels (knowledge, understanding, application) and (6) essay items to measure the levels (analysis, synthesis). The second tool was to prepare a test that measures serious thinking, consisting of (30) test items. And through the validity and reliability of the two tests and the calculation of their psychometric characteristics. The results showed the superiority of the students of the experimental group over the students of the control group who studied the same subject in the traditional program in the achievement test and in serious thinking.

Research Problem

Geography is one of the academic subjects whose nature allows the use of thinking in its education, on the basis that it is one of the basic renewable subjects in the school curricula. It is concerned with the study of man and his interaction with the environment, and contributes to providing the learner with a set of

geographical facts and concepts that contribute to the formation of a scientific and cultural personality. It helps him understand the environment in its various natural, human, social and economic aspects. Acquiring many skills, including the skill of identifying problems, imposing hypotheses, collecting and analyzing information, and developing thinking skills and mental processes such as analysis, deduction and prediction. (Khadir, 2014: 45) (Khadir, 2014: 45).

Although the subject of geography is considered one of the important study subjects for the student in that it contains many important facts and information, it still needs to develop its content, as the method of teaching it was done in a way that suits its teaching in the traditional way, which made it a subject for memorization and memorization only, and this was reflected in the level of student achievement. This was confirmed by some studies, including the study of (Al-Musawi, 2011) (Almusawiu, 2011), and the study of (Ahmad, and Sahib, 2012) (ahmag & Sahib), that there is a clear decline in the level of student achievement and that this decline is considered one of the most important problems that limit the school from fulfilling its mission to the fullest.

To achieve this, the researcher conducted an exploratory questionnaire, a full definition of the educational program, serious thinking, and a comprehensive explanation of each of his skills in Appendix (3) and distributed it to a group of teachers of geography, as they numbered (20) teachers in preparatory schools affiliated to the Baghdad Education Directorate. The questionnaire included Two questions:

What are the modern methods, strategies and programs that you follow in teaching the basics of geography and its techniques for the fourth literary grade?

What is serious thinking? Do you provide educational situations that develop serious thinking among your students during the lesson?

Most of the previous research and descriptive studies, including the study of (Al-Fili, 2014) (Al-Fili, 2014) and the study (Al-Zubaidi, 2012) (Alzubaydi, 2012) indicated that most of the methods used in teaching are traditional methods that focus on the material more than the learner and care about the aspect Knowledge and reliance on the transmission and indoctrination of information and do not contribute to addressing the intellectual side of students and the lack of geography teachers diversification in teaching methods and that most of the activities that students practice in the classroom are traditional activities that do not contribute to the development of their thinking in addition to the overcrowding of the class with large numbers of students, which hinders the teacher in Diversification in teaching methods, and most schools lack educational means, and if they exist, they are few and not sufficient to cover the subject. The research problem can be reflected in the answer to the following question:

Is the proposed educational program based on the theory of creative solution to problems in the Achievement of geography for fourth grade literary students and the development of their serious thinking?

Research Importance

Education is a necessary process for both the individual and society together. Its necessity for the individual person is to preserve his gender, direct his instincts, regulate his emotions, and develop his tendencies in a way that suits the culture of the society in which he lives. . (Nasser & Atef, 2010: 23) (Nasser & Atef, 2010: 23).

The curriculum constitutes the overall framework of the educational process, as it is the education tool to achieve its goals by providing students with a common amount of knowledge, skills, and methods of thinking and imparting to them the attitudes, values, and patterns of behavior that every learner needs as a minimum to ensure successful interaction and adaptation with society. The curriculum also works to satisfy the needs of students. Taking into account their tendencies and interests, developing them, solving their problems, and directing them to the ways and sources through which they can acquire knowledge on their own as a means to enable them to keep pace with recent developments. (Al-Wakil, and Muhammad, 2017: 79) (Alwal Keei&Muhammad).

The current research derives its importance from the objectives envisaged by teaching the subject of the foundations of geography, which are thought-provoking goals, as teaching it to students is at the forefront of the curricula that help learners understand themselves and the society in which they live, and enlighten the individual with his situation in time and place and introduce him to the relationships that link the present with the past and the near by far. (Al-Nizal, 2014, 6) (alnizal, 2014:6) that is, it links the temporal and spatial dimensions, and it is distinguished from the rest of the academic subjects by a geographical nature, as is evident from its name, which made it a fertile environment that greatly contributes to preparing individuals who enable them to employ their potential And their mental, emotional and skill abilities in order to confront them for the benefit of themselves and their society, and to inform them of the realities of social, economic and cultural developments in the different civilized environments within their society and other societies.

The method of teaching is one of the most important elements of the educational process and one of the pillars of the curriculum, as the success of the educational process depends on it. The upbringing of young people and generations is a sound upbringing, so the more care and attention is paid to teaching methods, the more effective the education will be and the more fruitful it will be. (Zaytun, 1990: 76) (Zaytun, 1990: 76).

Educational programs work to improve educational practices by using educational theories during the education process, saving effort and time, using educational means, educational devices and tools, and finding the relationship between theoretical and applied principles in educational situations. These programs work to stimulate dialogue and classroom interaction and provide the learner with many skills that help in Building his personality and preparing him for the future. (Yusuf & Muhamad, 2017: 176) (yusuf & Muhamad, 2017: 176).

By extrapolating research and studies in the field of educational programs, the researcher sees that most of the educational programs are derived from several theories, and the study of these theories is a basic requirement because they constitute the foundations and rules from which program designers proceed. Choosing and organizing teaching aids in an appropriate way helps the learner to show the desired responses, which reflect the learning process as a whole.

The theory of creative problem solving is one of the effective methods in teaching that helps students find solutions on their own through research, exploration, questioning and experimentation. It also provides students with an organized framework for analyzing their ideas in unconventional situations, and accustoms them to confronting problems and situations with a solid psychological motivation. (Zaytun, 2004: 123) (Zaytun, 2004: 123).

Some scientific conferences concerned with the theory of creative solution to problems, including the conference on creative solution to problems that was held in the United States of America entitled Creative Solution to Problems for teachers and their students in cooperation between (Baylor University and the Institute for Creative Solution to Problems) in the period (16-20 February 2003 AD), and the International Conference To teach science and mathematics, which was held between (University of the Philippines and the founder of UNESCO) in the period from (October 27-29, 2008 AD) in Cozon, America, under the auspices of the Institute for Creative Problem Solving. (Eafifi, et al., 2015: 142) (Eafifi, 2015: 142).

Thinking enables the learners to acquire many skills and develop desirable trends, and thus know what they do, how and why. Practicing behavior without proper thinking, which affects their chances of academic success and their daily lives. (Qitaami, 2007: 5) (Qitaami, 2007: 5).

From here, it is necessary to develop and teach the development of thinking skills in different societies and for different age groups, especially school and university students, as the thinking skill takes students to greater horizons, so the student can have a researching mind that explores, and he can see what others do not see and think in a different way and the ability To generate new ideas and new concepts that help the individual to develop anything, and make him an analyst capable of evaluation, development and renewal in his life and work in order to become an individual in a society capable of self-development.

Thinking is a cognitive process and an essential element in the knowledge structure that helps learners learn how to think and organize ideas and information in a way, and makes classroom situations more lively, students' participation in them more effective, and their understanding of what has been presented to them more deeply, thus increasing their self-confidence in facing the changing conditions of life around them. . (Hasan, 2016: 1957) (Hasan, 2016: 1975).

Serious thinking is one of the most important and least touched-up types of thinking by researchers, although it is one of the types of thinking that increases its value to man, as it allows the practice of mental operations and increases his experiences resulting from the interaction of the cognitive environment, and focus

on the vitality and interaction of the learner's activity and his level of knowledge, and develops the ability The individual is encouraged to learn by searching and searching for clear knowledge, so that this is reflected in raising the value of himself and his own achievements, to make learners more receptive to cognitive diversity and to employ it in their successful classroom behavior. (Aleatuwm, 2011: 122) (Aleatuwm, 2011: 122).

From the foregoing, the researcher believes that teaching serious thinking skills to the learner is very important, as he adopts it in educational situations that require him to think carefully to face a problem, reduce haste and think routinely, and work in a deliberate and approved manner to achieve specific goals and form a creative thought that has its tools and techniques that seek In creating new ideas, and making a judgment about the value of ideas in a serious way that works to raise the level of achievement among students.

The benefit of attainment appears in all aspects of our social life, especially in our future, through its progressive rise, as it prepares the individual to assume a good job position in most cases, and the achievement determines to a not insignificant degree the social and economic value of the individual, and the career ambition that the individual aspires to achieve, and every society is keen to Its achievement, gives it great importance, and monitors educational institutions, as the level of achievement indicates the competencies of those institutions and their ability to achieve their desired goals. (Marei & Alhila, 2002: 127) (Marei & alhila, 2002:127).

Based on the foregoing, the importance of the current research is highlighted through the following points:

1. The importance of geography in general, due to its connection to the direct reality of the individual, as it is a fertile field that provides students with ideas, concepts, and skills, and its important contribution to the formation of students' personality and behavior.

2. An educational program based on the theory of creative problem-solving, if its effectiveness is proven, may help open the way for the authors of educational curricula to identify the characteristics of this age group and deal with them accurately when organizing the educational content in a manner that suits the abilities of the students.

Research Objectives

The current research aims at demonstrating the effectiveness of a proposed educational program based on the theory of creative solution to problems in the achievement of geography for literary quarter students and the development of their serious thinking. For the purpose of verifying the goal of the research, the researcher formulated the following zero hypotheses:

The first hypothesis: There is no statistically significant difference at the level of significance (0.05) between the average achievement scores of the students of the experimental group that teaches geography using the educational program prepared according to the theory of creative problem solving, and the

average scores of the students of the control group that studies the same subject in the traditional way. in telemetry.

The second hypothesis: There is no statistically significant difference at the level of significance (0.05) between the average scores of the serious thinking of the students of the experimental group studying geography using the educational program prepared according to the theory of creative problem-solving, and the average scores of the serious thinking of the students of the control group studying the same subject. by the traditional method of telemetry.

Research Limits

This research is determined by the following

1.   The creative solution to problems represented by (generating new realizations, generating new concepts, generating new ideas, generating new alternatives, generating new innovations)
2.   Topics of the book "Foundations of Geography and Its Techniques" to be taught by the Ministry of Education for the fourth literary grade, twelfth edition (1443 AH - 2012 AD), which is approved for teaching for the academic year (2021-2022).
3.   Students of the fourth literary grade in government day secondary and preparatory schools for boys affiliated to the General Directorate of Education of Baghdad Governorate - the second Rusafa for the academic year (2021-2022).

Terminologies

1.   Effectiveness

1.   Linguistically: Ibn Manzoor (2003) as: "It was mentioned in Lisan Al-Arab as taken from (Effect). Effective, especially in good and bad." (Ibn Manzur, 2013: 36) (Abn Manzur, 2013: 36)
2.   A term defined by: Al-Khawali (1981) as: "efficiency of success, by the ratio of the product to the input." (Al-Khawali, 1981: 12) (Al-Khawali, 1981: 12)
3.   Theoretical definition of the researcher: The ability to achieve the set goals in order to achieve the desired results and reach them as far as possible.
4.   The procedural definition: the ability to achieve the goals that the educational program prepared by the researcher according to the theory of creative problem-solving will bring about in increasing the achievement of the fourth-grade literary students (the experimental group of the research sample) in the subject of geographic foundations and its techniques and developing their serious thinking.

2.   Tutorial

1.   Linguistically: The Arabic Language Academy (1998) as: "The comprehensive educational paper for arithmetic or the plan drawn for a work such as a lesson program." (The Arabic Language Academy, 1998: 204) (Majmae allughat alearabia, 1998: 204)

2.   A term defined by: Shaw (1977) as: "a circle consisting of interrelated elements expressed in activities, interconnected with each other, beginning with general objectives and ending with a set of strategies to evaluate the extent of achieving objectives." (Shae, 1977: 340)

3.   Jawad (2020) that: "an integrated system consisting of parts that are objectives, content, methods, methods and assessment methods so that these parts are the basis for interaction with each other in a way that leads to ensuring the achievement of the desired goals." (Jawad, 2020: 152)

4.   Hassan Warsan (2022) that:

5.   Knowledge and information organized in a specific way, which are included in the experiences and activities of the curriculum, including the textbook, to achieve the desired educational goals. (Hasan, Warusn, 2022, 173) (Hasan & warusn, 2022:173)

6.   The procedural definition: An integrated system of knowledge, intellectual skills, processes, experiences, means, and appropriate methods prepared by the researcher according to the assumptions of the theory of creative solution to problems. The subject of the foundations of geography and its techniques is taught for the fourth literary grade for the students of the experimental group from the research sample throughout the duration of the experiment in order to increase their achievement and develop their serious thinking.

3.   Creative Problem Solving

A- A term defined by: Abu Hatab (1983) as: "a framework of processes that acts as a system (system) that includes strategies for productive thinking, that can be used to understand problems, generate diverse, multiple, unconventional ideas, and evaluate and develop ideas." (Abu Hatab, 1983: 176) Abo hatab, 1983: 176).

Al-Asar (2000) defines it as: "any effort made by an individual or group in creative thinking with the aim of solving a problem." (Al-Asaer, 2000: 28) (Alaeusar, 2000: 28).

C- Theoretical definition of the researcher: It is one of the theories that emphasizes learning through reaching new solutions and ideas about biological problems, which helps individuals to distinguish in responding to challenges and overcoming problems.

4.   Achievement

1.   Linguistically: Ibn Manzoor (2011) that: "It happened, the outcome of everything, what remains, is established, and everything else is gone. It is from reckoning, deeds, and the like, and Achievement, distinguishing what happens, the name is the outcome, and the outcome is the remainder, and the one is the result." (Abn Manzur, 2011: 143).

2.   A term defined by: Webster (1971) as: "a student's achievement, both qualitatively and quantitatively, during a specific semester." (Webster, 1971: 308).

3.   Theoretical definition of the researcher: the degree or level of success achieved by the learner in a specific educational field.

4.   The procedural definition: the achievement achieved by the students of the research groups, in the information and skills included in the special material for the research experiment, measured by the final score that they obtain after performing the achievement test prepared by the researcher, which is applied at the end of the research.

5.   Geography

1.   A term defined by: Morell (1985) as: "the science that searches for identifying spatial differences in natural and human phenomena and understanding the processes that formed these differences." (Morill, 1985: 32)

2.   Al-Khafaf (2001) as: "the science that studies the location of natural and human phenomena and their distribution on the earth's surface, their variation and the relationships between them." (Al-Khafaf, 2001: 31)

6.   Serious Thinking

1.   Linguistically: Ibn Manzoor (1994) "In the intermediate dictionary, thinking is the application of the mind to a problem in order to reach its solution, thinking is meditation, and the noun is thought and idea." (Abn Manzur, 1994:109).

2.   A term defined by: Stenberg (1986) as: "the mental and strategic processes and representations that the individual uses to solve problems, make decisions, and learn new concepts based on stability and analysis." (Stenberg, 1986: 54).

3.   The theoretical definition of the researcher: The researcher adopted the definition (Stenberg, 1986: 54).

7.   The Fourth-Grade Literary Students

The Ministry of Education (2013) defined it as: - It is the first grade of the three grades of the preparatory stage in which students who hold an intermediate school certificate are accepted. and literary). (Ministry of Education, 2013).

2nd Topic

Theoretical Background and Previous Studies

This chapter presents the theoretical features from which the basis of this research stems from in defining its frameworks and what the sources and literature related to it have proposed, which helps to strengthen, enrich and address it from a scientific and educational perspective. The researcher decided that the axes of his study should be compatible with the requirements of his current study, which are the educational program, the theory of creative problem solving, serious thinking, previous studies, and the balance between previous studies and the current study.

The first axis: The educational program: The educational program is considered one of the important outputs in the science of instructional design, as it translates what is contained in the science of instructional design, and among the sciences that tried to link the two sides, the theoretical aspect that relates to the theories of general psychology, and the applied aspect that relates to describing educational programs and strategies Appropriate for learning, how to use them in the classroom, identifying the appropriate educational and technological tool and means for teaching, such as the use of computers, educational television, recorders, educational pens, etc., and how to use these tools in the classroom. (Alhila, 2008:31)

The educational design is a set of activities and procedures that ensure the planning of the educational situation within a specific goal and linked to a time limit and calculated and measurable steps, drawn and implemented individually or collectively with a short or comprehensive educational situation in the long term, achieving specific and calculated results or results with broad objective dimensions. (Alzand, 2004:38)

The educational program includes a set of activities planned for the development of one or more aspects of the educational process in the light of goals, data, determinants, and a known time limit. For a specific group of learners in order to achieve intended educational goals in a specific period of time. (Alkinaniu, 2020:2).

8. Stages of designing the Educational Program

When designing the educational program, it goes through the following stages

1. Analysis stage: Analysis is the cornerstone of all other stages of education design. During this stage, the problem, its sources, and possible solutions must be identified. This stage may include research methods such as needs analysis, task analysis, content analysis, and target group analysis. The

analysis process aims to prepare a complete and comprehensive vision of the subject you intend to teach and all the factors influencing it, such as the characteristics of the beneficiary students, (Hassan & Rasen, 2022:98), in order to take into account these factors during the next stages of the design process and the analysis of the educational material to the main and secondary educational tasks and previous requirements. necessary to learn it. This field also includes analyzing the learner's characteristics and determining his level of readiness, abilities, intelligence, motivation, attitudes and skills. Analyzing the external educational environment and identifying the available material and non-material capabilities (Qatami et al., 2008: 101).

2. The design stage: design means engineering something in a way according to certain rules, or an engineering process for a situation. (Khalil, 2023: 176), and at this stage the best educational treatments and plans are identified and selected, and it also includes organizing the objectives of the educational material, preparing Examinations, organizing course content, and planning the evaluation process. At this stage, the environment surrounding the program and its contents of materials, devices, and educational aids are designed and organized in a way that helps the learner to proceed in accordance with the achievement of the set goals (Aleudwan & Hawamida, 2011:30).

3. The implementation phase: The implementation phase contributes to reviewing and developing the education design model used in its entirety. The actual implementation of the educational programs provides important information that is not available at the start of the education design project. The importance of the implementation process is not limited to improving the program and educational designs only, but it is the stage of developing and reviewing the educational design, as well as many of the sources and literature on teaching design combine the two phases of implementation and evaluation, because they are almost inseparable and share one goal, which is experimenting with the educational program and modifying it to achieve the desired goal (Salim, 2004:139).

4. Evaluation stage: Evaluation is one of the most important elements of the educational system, and one of the basic foundations in the educational process, because it has a basic relationship with goals and competencies, in addition to being the real criterion for diagnosing strengths and weaknesses in the educational system. Therefore, the evaluation stage is one of the important stages in any educational program, as it aims to monitor the performance of the educational system to make adjustments to it and to judge the entire teaching process, with the aim of improving it or determining its suitability. And its development through evaluating the program itself and evaluating the students (Qatami et al., 2008: 128).

The second axis: the theory of creative solution to problems

Concept and Importance of Creative Problem Solving

The theory of creative problem solving is one of the metacognitive strategies that have presented itself in the field of science and education, due to its effectiveness in the teaching process, because it helps students find solutions on their own through research, exploration, questioning, and experimentation. It also helps them analyze and organize their ideas in non-traditional educational situations. And accustom them to face the problems that they face in similar situations with confidence and competence (Alzughbi, 2014: 305).

The theory of problems in a creative way is nothing but a kind of learning that includes complex relationships. The student who works to solve problems has a motive to confront the problem in order to achieve goals. Problem-solving is basically a search for information related to a problem that is not available for its solution, and rearranging and correcting it requires An exploration of the relationships between means and ends more than what other forms of learning require, and the difference is in degree rather than in kind (Aldaeja, 2014:34).

(Isakeen & Parnes, 1985) indicate that the problem within the creative solution to problems is not a dilemma, but rather it represents opportunities and challenges for successful changes and constructive tools. The daily challenges faced by individuals represent opportunities for professional and personal growth, so the problem may be any vague and important situation that needs New alternatives to confront it and a plan for successful implementation, as the creative solution to problems is based on several foundations, namely:

9.   Creative potential exists in all individuals

Creativity usually appears according to the interests, preferences, and styles of individuals. (Isakeen & Parnes, 1985:231)

(Qatami, 2002) dealt with the concept of creative problem solving as a process involving a group of small operations that begins with identifying the problem, then generating various solutions for it, then evaluating these solutions and choosing the best one, and while the individual performs these operations, he employs many divergent thinking capabilities: Fluency, flexibility, originality), and the abilities of convergent thinking are: (identifying the problem, evaluating solutions, selecting the best solutions and implementing them). (Qitaami, 2022:187).

The third axis: serious thinking

The concept of serious thinking

Serious thinking is one of the patterns of thinking resorted to by those who can break the restrictions of vertical thinking, so they can see more angles of the

problem that enables him to produce more ideas to solve it, and this method remains rational for its owner and illogical for others with a vertical style of thinking (Almumini, 2023:177).

The owner of the serious thinking pattern is not satisfied with a single solution, but rather puts several possible solutions to the problem and then excludes the inappropriate solutions until he reaches the correct solution and then takes the decision. De Bono expressed serious thinking as "the way in which we look at things or topics from various different angles in order to separate between what is going on in the mind all the time and meaningful thinking, which is the main focus of serious thinking, and it is possible to use the term serious thinking in two meanings, one of which is specialized and the other general.

1. The specialist: a group of systematic methods are used to change concepts and perceptions and generate new ones.

2. General: Discovering multiple possibilities and methods instead of taking possession of a single path. So (Norhana, 2012) defines serious thinking as moving from a well-known idea to creating new, more creative ideas. (Norhana, 2012:15), and (Abd Rabbo, 2017) believes that serious thinking is a form of thinking outside the box and breaking out of the ordinary in thinking, breaking out of stereotypical thinking and searching for other unusual ways to reach multiple options and many proposed solutions to the problems facing Pupils when they study (Abd Rabbo, 2017:187).

Serious Thinking Uses

1. New ideas: Most of the time one of us is wary of addressing new ideas, but despite that he is completely happy when generating them and deducing what is in them, and one of us may not try to generate new ideas that cannot be generated by trying and experimenting, and yet there are jobs It requires and forces a person to generate new ideas, such as research, design, architecture, media, etc.

2. Solving problems: Even if a person does not have the motivation or incentive to generate new ideas, it is the problems that force him to do so. what or get something.

3. Periodic re-evaluation: It means reconsidering once again the things that cannot be doubted, that is, challenging all assumptions that say that this process is useless for re-evaluation of something because there is an urgent need for re-evaluation at all, as it is only useful when re-evaluation Again, if not in a long time, it's a deliberate attempt to look at things in a new way.

4. Reducing assertive evaluation and polarization: Perhaps the most important use of serious thinking when it is used deliberately at all, but it represents a skill possessed by a person, on the basis that it is the emergence of those problems that will only create those divisions and polarization of thinking that the mind imposes on what It is studied and discussed (Norhana, 2012:12).

The third axis: previous studies

1- Study (Al-Abadi 2013): The study was conducted in Iraq, and aimed to identify (the effectiveness of a computerized educational program in the Achievement of geography and the development of creative thinking among students of the fifth literary grade). The researcher adopted an experimental design with partial control. The research sample consisted of (65) students. In Baghdad distributed as (33) students in the experimental group who studied according to the educational program and (32) students in the control group who studied according to the traditional method.

The researcher adopted the experimental approach, and the research tools were represented by a test that measures creative thinking skills, and the researcher used the statistical methods, namely, chi-square (Ca2), Cohen's equation, the t-test for two independent samples (t-test), the coefficient of difficulty and ease, and an achievement test. The study concluded: The superiority of the group students Experimental on the students of the control group in the achievement test in the subject of geography. The students of the experimental group outperformed the students of the control group in the creative thinking test (Aleabaadiu, 2013).

2- Study (Al-Anbaki 2014): The study was conducted in Iraq, and it aimed to identify (the effectiveness of an educational program according to the systemic approach in achieving and developing geographical skills among fifth grade literary students). The researcher adopted an experimental design with partial control. The research sample consisted of (60) students in Baghdad distributed as (31) students in the experimental group who studied according to the educational program, and (29) students in the control group who studied in the traditional way. The researcher adopted the experimental approach, and the research tools were represented by a test that measures creative thinking skills, and the researcher used the following statistical methods, the t-test for two independent samples (t-test), an achievement test, a skill test, Pearson coefficient, and Point by Serial correlation coefficient. The study concluded: The superiority of the experimental group students Those who studied in the educational program according to the systemic approach to the students of the control group who studied in the traditional way in the post-achievement test and the geographical skills development test (Aleinbaki, 2014).

Chapter III

Research Methodology and Procedures

Research Methodology

The current research aims to identify the effectiveness of an educational program based on the theory of creative solution to problems in the achievement of

geography for fourth grade literary students and the development of their serious thinking. The researcher uses the experimental method to identify the effectiveness of the proposed program. The experimental research is "an intentional and controlled modification of the specific circumstances of a phenomenon, and the observation and interpretation of the changes that occur to it" (Abbas et al., 2014: 79).

Experimental design: The experimental design is defined as the plan in the light of which the allocation of individuals to the experimental conditions or experimental treatments is built for the individuals in the study sample. : 478), and to achieve the goal of the research, the researcher adopted the experimental design with partial control, which is the design of the control group with a pre and post-test, and it consists of two groups, the first is an experimental group that is taught according to the educational program, and the second group is a control group that is taught in the traditional program, and the two groups are exposed at the end of the experiment to Two tests, to measure achievement in geography, and to measure serious thinking, and Table (1) illustrates this.

Table (1)

Group	Test	Independent Variable	Dependent Variable	Test Type
Experimental	Pre-Test	Suggested Educational Program	-Achievement -Serious Thinking	Post-Test
Control		_____		

Research Experimental Design

Research community: The research community means that it is all the individuals who carry the data of the phenomenon that is within the reach of the study, and it can also be said that the community is the Achievement of research units from which data is intended to be obtained. (Qandiliji, 2018, 192) (Qandiliji, 2018:192) Since the research population of the current study included students in the fourth literary grade in government preparatory and secondary day schools for boys in all directorates of education in Baghdad governorate, the researcher randomly chose the General Directorate of Education of Baghdad - Rusafa The second for the academic year (2021-2022) from the six directorates in Baghdad Governorate.

Research Sample

The sample is considered part of the community on which the study is being conducted, which the researcher chooses to conduct his studies on according to special rules in order to represent the community correctly (Abdul Momen, 2008: 184), and for large societies in most cases, the researcher cannot study the entire phenomenon, so he resorts to selecting the sample from that community to help him achieve the research goals and accomplish his mission (Milhim, 2005:220).

Equivalence of the two research groups (internal safety): One of the most important factors that must be verified is the internal safety factor of the experimental design, and by conducting equivalence between each of the groups (experimental and control) in the variables that may affect the dependent variable (Alzuwbari, 1981:92). Where the researcher worked before starting the experiment to conduct equivalence in some variables that he might see as affecting the validity of the experiment and the accuracy of the results, and by conducting the process of equivalence between the students of the two research groups in the variables of the research.

The steps for building the proposed educational program are as follows

10.   Determine the principles of the program

The proposed program is based on a number of starting points, namely

1.   The traditional educational systems that depend on direct thinking, which provides ready-made information, which does not exceed the selection of information that only serves the problem. Education today is in need of benefiting from the innovative characteristics of serious thinking, which gives an opportunity to upgrade the dimension of thinking to keep pace with the scientific and technological developments the world is witnessing today.

2.   The need to review the educational content of geography and organize it in a way that suits the nature of students and the cognitive and scientific changes that the world is witnessing today.

3.   Formulating behavioral goals at the beginning of the educational program ensures that the designer directs the teaching process and organizes students' efforts towards achieving those goals, and makes the educational process more effective and successful, and easier for the teacher and the student alike.

11.   Preparing the educational program

To study the different models of educational design in its various forms and types, we find that this process takes place in the light of a set of stages, which are the main and specific procedural steps carried out by the educational designer, and may include a group of sub-processes, although the educational design models differ in their form, but they agree in their essence In terms of following specific procedural steps called the educational design stages, which are (analysis, design, implementation, evaluation), (Zayer and Samaa, 2015: 131).

Verifying the Validity of the Suggested Program

The sincerity of the program is considered one of the important foundations that must be available in the educational program, and the sincerity of the program means the participation of all its elements in achieving educational goals, including content, teaching methods, learning methods, activities, and evaluation. (Al-Shibli, 2000: 130), and the program became ready for application and implementation after it was presented to a group of experts and specialists, to verify its effectiveness, Appendix (14).

Research Tool

It is the method by which data is collected that answers research questions or tests its hypotheses. It is also called measurement methods and includes questionnaire, interview, observation, and tests (Abu Hweij et al., 2003: 65), where the researcher saw that the best tool for his research is tests.

12.　　Achievement Test

Achievement tests are among the frequently used statistical methods for measuring and evaluating achievement, and an achievement test is an organized procedure to determine how much the learner learns, and the accuracy of the results depends on the type of tool used. (Suleiman, 2010: 191).

To find out the effectiveness of the independent variable, which is (the educational program based on the theory of creative problem solving) in raising the level of the dependent variable, which is (the achievement of geographic material) among the research sample compared to the traditional program, where the researcher prepared a test that includes two types of objective and essay tests to measure what has been achieved in a subject. Geography for the fourth literary grade according to the system of the Ministry of Education, and the researcher chose the objective tests of the multiple-choice type because they are the most common and used in the tests, because they have a high degree of honesty, stability, and objectivity, and they are characterized by a variety of questions that measure different goals and cover the part that the teacher evaluates (Mansoor, 2001: 360).

Thus, the achievement test consisted of (41) items. The first question was one of the objective questions and included (35) items from the multiplex test. As for the second question, it was of the type of essay questions, as the second question included (6) items, as shown in the appendix (17).

Serious Thinking

One of the objectives of the current research is to identify the effectiveness of the educational program in developing serious thinking among students of the fourth literary grade, and to achieve this goal it is necessary to build a test that

measures serious thinking, and by looking at studies and literature that dealt with serious thinking, the researcher built a test that measures Serious thinking, and in line with the research requirements, as the test included the following steps:

1.   Reviewing previous studies and literature that dealt with serious thinking.
2.   Determine the purpose of the test, as it aims to measure students' ability to think seriously.
3.   Determining the skills on which the test will be formulated, which are defined as follows
4.   (Generating new perceptions - generating new concepts - generating new ideas - generating new alternatives - generating new innovations (renewals).
5.   Drafting the test paragraphs in the light of the theoretical framework for serious thinking, and in a manner commensurate with the level of the students of the fourth literary grade, as a group of test paragraphs was formulated and there were (30) paragraphs of the test type of multiple with four alternatives, where the researcher presented the test in its initial form as an appendix (18) on a group of experts and arbitrators in the methods of teaching geography and in measurement and evaluation, Appendix (6).
6.   The researcher placed the instructions for answering the test paragraphs at the front of the test, to explain to the student how to answer.

Test Validity

To verify the validity of the serious thinking test, the researcher conducted the following:

13.   Virtual Validity

The researcher presented the paragraphs of the serious test in its initial form, Appendix (18), to a group of experts and arbitrators in the curricula and methods of teaching geography, measurement and evaluation, Appendix (6), in order to identify their opinions about the validity of the test items and the soundness of their wording. 85% or more with the agreement of the arbitrators, and after presenting it to the opinions and arbitrators, some of the test paragraphs were modified and the final version was reached in Appendix (19), and thus the test became ready for application.

B- Construction validity: The correlation coefficients between the degree of each paragraph and the total score of the scale are among the indicators of construction validity, because the concept of validity approaches the concept of homogeneity of the paragraphs in measuring the characteristic measured by the test, as the correlation of the degree of each paragraph of the scale with an external or internal test is considered indicators. Believe it, and when an external criterion is not available, the internal criterion is usually used, and the respondent's total score on the scale is the best internal criterion. (Anastasi, 1976, p209), statistical

methods: for the purpose of achieving the goal of the research, the researcher used the following statistical methods, relying on the program (spss) the statistical bag for social sciences and the Excel program, as follows:

1. The t-test for two independent samples of medium-sized samples to calculate equivalence between the experimental and control groups in variables (chronological age, previous achievement in Geographical Foundations and Its Techniques, testing previous information in Geographical Foundations and Its Techniques, intelligence level, and the pre-serious thinking test) and in analyzing the results for the test Achievement and serious dimensional thinking.

2. The t-test for the two correlated samples to calculate achievement and pre and post thinking between the experimental group and the control group.

3. Difficulty coefficients and discriminatory power to find the coefficients of difficulty and discriminatory power for the achievement and serious thinking test items.

4. The effectiveness of false alternatives to find the effectiveness of false alternatives for the objective items of the achievement test.

5. Pearson correlation coefficient to find out the validity of the correlation of the paragraphs with the total score of the serious test.

6. Equation (Qodder-Richardson 20) to calculate the stability of the serious thinking test.

7. Cronbach's alpha equation for calculating the stability coefficient of the achievement test items.

The Fourth Chapter

Results

Presentation and interpretation of the results

A- The first hypothesis: The first hypothesis of the research stated that there are no statistically significant differences at the level of significance (0.05) between the average achievement scores of the students of the experimental group that teaches geography using the educational program prepared according to the theory of creative problem solving and the average achievement scores of students The control group that studies the same subject using the traditional method of telemetry.

To verify the validity of this hypothesis, the researcher used the independent sample t test, in order to detect differences in the post application in the achievement of students of the experimental group studying geography using the educational program prepared according to the theory of creative problem-solving, and the average achievement scores of the students of the control group studying the same subject. The average achievement for the experimental group was (76,303) with a standard deviation of (10,870), while the average for the control

group was (54,188) with a standard deviation of (10,378). Table (36) shows the results related to this hypothesis.

Table (36)

Group	No. of Students	Arithmetic Mean	Standard Deviation	T Value	Degree of Freedom	Tabular T Value	Sig.
Experimental	33	76‹303	10‹870	8‹385	63	1‹998	Significant
Control	32	54‹188	10‹378				

Significance of differences in achievement in telemetry between the experimental group and the control group from Table (36). We note that the calculated t-value of (8,385) is greater than the tabular t-value of (1,998) at the level of significance (0.05) and a degree of freedom (63). Thus, there are statistically significant differences in achievement in the post-application, the achievement of the students of the experimental group that studies geography using the educational program prepared according to the theory of creative problem-solving, and the average achievement scores of the students of the control group that studies the same subject, that is, the first zero hypothesis is rejected, which means students excel The experimental group on the students of the control group in the achievement test, which means that the program is effective and increases achievement.

B- The second hypothesis: The second hypothesis of the research stated that there is no statistically significant difference at the level of significance (0.05) between the mean scores of the serious thinking test of the students of the experimental group studying geography using the educational program prepared according to the theory of creative problem solving and the mean scores of Serious thinking test for students of the control group studying the same subject in the traditional way in telemetry.

To validate this hypothesis, the researcher used the independent sample t test to detect differences in the posttest application of the serious thinking test for students of the experimental group studying geography using the educational program prepared according to the theory of creative problem-solving, and the average scores of the posttest for serious thinking among students of the control group studying the subject. The same, where the mean of the experimental group in the serious thinking test was (22,364) with a standard deviation of (3,219), while the average of serious thinking of the control group was (6,063) with a standard deviation of (2,462). Table (37) shows the results. related to this hypothesis.

Table (37)

Group	No. of Students	Arithmetic Mean	Standard Deviation	T Value	Degree of Freedom	Tabular T Value	Sig.
Experimental	33	76‹303	10‹870	8‹385	63	1‹998	Significant
Control	32	54‹188	10‹378				

The significance of the differences in serious thinking in the post-measurement between the experimental group and the control group from Table (37). We note that the calculated t-value of (22,881) is greater than the tabular t-value of (1,998) at the level of significance (0.05) and the degree of freedom (63) Thus, there are statistically significant differences in serious thinking in the post-application, the achievement of the students of the experimental group that studies geography using the educational program prepared according to the theory of creative problem-solving, and the mean scores of serious thinking for the students of the control group that studies the same subject, i.e. rejects the second zero hypothesis, which This means that the students of the experimental group outperformed the students of the control group in the serious thinking test, which means that the program is effective and increases serious thinking.

Chapter V

Conclusion, Recommendations and Suggestions

Conclusion

1. The educational program, based on the theory of creative problem solving, proved its effectiveness in achieving achievement and developing serious thinking among fourth grade students.

2. The possibility of teaching the educational program according to the theory of creative problem solving as an integrated system with foundations, principles and skills, and to practice it in our schools and with the available capabilities.

3. The educational program prepared according to the theory of creative problem-solving through its methods, cognitive strategies, activities, content and methods of evaluation contributed to providing students of the fourth literary grade with the concepts of geography and improving serious thinking skills.

Recommendations

1. Urging the creators of curricula and directorates of education to take into account the results of research and studies that have proven the effectiveness of their educational programs, including the current study, in order to include geography books, especially the book "The Foundations of Geography and Its Techniques" for the fourth grade of literature, to the theory of creative solution to problems because of its effectiveness in raising the level of achievement and developing serious thinking.

2. Urging the committees to compose textbooks to include motivational activities commensurate with the age group of the target group, with the need to diversify them in order to train them on how to think and use it to adapt to their environment.

3.   Opening development courses by the Ministry of Education for its teachers in order to bring educational programs into practice and not be limited to traditional teaching methods that rely on memorization and memorization.

Suggestions

1.   Conducting a study that investigates the effectiveness of an educational program based on the theory of creative problem solving in other variables, such as attitude, motivation, and inclination towards material.
2.   Conducting a study similar to the current study for other academic stages and for other academic subjects.
3.   Conducting a study examining the effectiveness of this program in the achievement of female students, since this study was limited to male students.

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