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THE EFFECTIVENESS OF DIVERGENT THINKING STRATEGIES ON THE ACHIEVEMENT OF SECOND INTERMEDIATE STUDENTS IN THE SUBJECT OF SOCIAL SCIENCES AND THEIR MENTAL FLEXIBILITY

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ABSTRACT

The aim of the research is to identify: effectiveness of divergent thinking strategies on the achievement of second intermediate students In the subject of social sciences and their mental flexibility. The research sample consisted of 64 female students who were divided equally into two experimental groups that studied divergent thinking strategies, and the experimental group studied in the traditional way. He prepared an achievement test, a type of multiple-choice, that amounted to 40 items. He prepared a mental flexibility scale consisting of 30 items. A test was conducted to test the validity and reliability scale. The appropriate statistical methods were used. Among the results, the experimental group outperformed the experimental group at the level (0.05) in the achievement test and the mental flexibility scale over the control group.

INTRODUCTION

There is no doubt that the information revolution that the world is witnessing now has brought about, and is still making a huge leap in various fields of knowledge, and this is due to the reliance of this revolution on advanced scientific knowledge and advanced information and the rapid information explosion resulting from the doubling of the volume of knowledge. Therefore, it was natural that this cognitive development was accompanied by a development in great techniques that included all the pillars of the educational process, including teaching strategies that emphasize thinking and raising questions, leading to mastery and creativity (Amer, 2020: 225).

Therefore, there should be new teaching strategies that help to implement thought and produce new ideas that lead to deep understanding as it seeks to

activate the role of students. He urged them to think of all kinds to reach different answers by provoking them with various questions and providing them with opportunities, to express their opinion in an atmosphere of freedom, and to work on spreading ideas without stopping, such as divergent thinking strategies. The interest in divergent thinking strategies has increased as a natural result of studies and research conducted on the human mind, which revealed new horizons for teaching, working to free the minds of students, while training them on the speed of effective and appropriate responses to the nature of different situations (Muhammed, 2018: p. 126).

Divergent thinking strategies are based on a group of diverse interconnected abilities that are developed by raising complex questions and investigation resulting from reflection, discussion and use of ideas, and through it students achieve more than just possessing knowledge, but rather insights and capabilities that are reflected in different performances that can be developed in the curriculum to reach mastery and creativity (Abdul-Bar, 2019: p. 103).

Creativity is one of the most important educational purposes that human societies seek to achieve. Creative individuals play an important and effective role in the development of their societies in all economic and social fields. Maslow points out that the conditions of the contemporary world require attention to the creative process and provoke thinking in teaching through manifold strategies that raise the ideas and capabilities of students. To change to suit the different situations they face or emergency situations, and their ability to absorb new ideas according to changing circumstances and multiple viewpoints, and this is called mental flexibility, which is the basis of the innovation process. Again, in accordance with the new circumstances, and the person with mental flexibility and innovation is considered the person who is able to resist the process of staying within the traditional frameworks of thinking and solving various problems (Youssef, 2020: 19).

RESEARCH PROBLEM

Many social studies teachers do not follow modern teaching methods and strategies and have not kept pace with the developments that these methods and methods have reached in the world. The teacher's contribution is no longer limited to the mere transfer of knowledge, but has become a guiding and leading role in choosing the appropriate method and method for teaching, so it became necessary for the teacher to follow up The study supported (Jassim and Razzouk, 2020): It indicated despite the modernization of the social studies curricula in the middle school and interest in understanding students and discovering their mental abilities, counting them as the center of the educational process, and recommendations for using modern strategies in Teaching, as there is a significant weakness in achievement that may be due to traditional teaching methods (Jassim and Razzouk, 2020: p. 94).

The problem of the research can be summarized as follows: that the majority of social studies teachers did not follow successful contemporary teaching methods and strategies and direct their students to be a major focus in it, so the research problem is formulated with the following question: (The effectiveness of divergent thinking strategies on the achievement of second

intermediate students in the subject of social sciences and their mental flexibility)?

Research Importance: -

The importance of the research is reflected in the following: -

1- The importance of using modern strategies (strategies of divergent thinking) that can be employed in the teaching process to achieve educational goals and which contribute to the development of teaching social studies for the first intermediate grade.
2- The attention of teachers and teachers may be drawn to the importance of the mental flexibility skill of students during the training courses that are held for them.
3- It may help intermediate school students in modifying the cognitive structure by correcting misperceptions that result in a modification of their general behavior.
4- Local studies did not address teaching through divergent thinking strategies for social subjects and linking it to mental flexibility (according to the researcher's knowledge).

Research Objective: -

The current research aims to identify: -

The effectiveness of divergent thinking strategies on the achievement of second intermediate students In the subject of social sciences and their mental flexibility.

Research Hypotheses: -

1- There is no statistically significant difference at the level of significance (0.05) between the average achievement scores of the experimental group students who study social studies using divergent thinking strategies, and the average achievement scores of the control group students who study the same subject in the traditional way in choosing post achievement.
2- There is no statistically significant difference at the level of significance (0.05) between the average scores of the experimental group students who study social studies using divergent thinking strategies, and the average scores of the control group students who study the same subject in the traditional way in the dimension of cognitive flexibility scale.

Research Limits: -

The current research is determined by:

1- Spatial boundaries: It is represented in the governmental morning middle schools affiliated to the Directorate of Education of Ramadi District - Anbar (2020-2019).

2- Human Borders: A sample of second intermediate students from Al-Shumukh Secondary School for Girls.
3- Time limits: The current research is represented in the second semester of the academic year 2020-2019.
4- Objective limits: - The current research is determined by teaching the chapters (third, fourth and fifth) of the second intermediate social subject.

Define Terms:

First: Effectiveness: the amount of desired change in the experimental study caused by the independent variables in the dependent variables on which the experimental research design is based (Khammas, 2018: p. 336).
Procedural effectiveness: It is the size of the change in the achievement of the first intermediate grade female students in the social subject through teaching using external readings and divergent thinking strategies.
Second: Divergent Thinking Strategies: A set of teaching strategies concerned with thinking patterns that contribute to the development of students' ability to receive, absorb and represent knowledge, integrate it into their mental structure, align it with their previous experiences, and turn them into meaningful acquired experiences for them (Ahmed, 2017: p. 95).
Procedural definition: Teaching strategies of brain-based learning applications that depend on a series of learning successive and branching questions for the methodology topics of the first intermediate social subject that provoke divergent thinking to issue a specific judgment or devise new solutions consisting of five strategies. (Default thinking, reverse thinking, symbolic systems, symmetry point of view analysis).
Third: Attainment: the level of education that has been achieved after passing through educational experiences in a specific period and measured by written or performance tests (Sahin, et al, 2018: p.2)
Procedural achievement: The amount of educational and cognitive achievement achieved by the first intermediate grade students after passing through educational experiences related to historical subjects, and it is measured by the degree they obtain in the post-achievement test that will be conducted at the end of the experiment.
Fourth: mental flexibility: the individual's ability to change his state of mind according to the change of situation, that is, his ability to think in different directions, and to look at the problem from multiple angles, that is, his ability to generate different expected ideas and transform the course of his thinking with changing stimuli, which is the opposite of intellectual stagnation, which does not accept change according to the need) . (Al-Jughayman, 91:2018)
Definition of procedural mental flexibility: It is the ability to change the state of mind to move thinking from one position to another according to the requirements of the new position, and it is measured by the degree obtained by first-grade students on the dimensional mental flexibility scale prepared for this.
Fifth: Sociology: the subjects that study man in his relations and interactions with others, his relations with the environment and society, human issues, problems, events and situations, and is considered a link between all the natural and human sciences, as they are linked to each other to establish the relationships that develop between members of society (Alwan, 2016: p. 531) .

Procedural definition of social studies: a sociology curriculum for second-grade intermediate students that contains geographical and historical knowledge about ancient civilizations with the aim of acquiring civic values, skills, and trends that aim to inculcate concepts of good citizenship by organizing the content of the social book in the form of an integrated and interconnected knowledge matrix.

BACKGROUND THEORY AND PREVIOUS STUDIES

Divergent Thinking Strategies:

Thomas Cardelicio and Wenda Field indicated that there are seven strategies through which to increase the neural network in the human brain, which would contribute to achieving the requirements of good learning, and provide students with enough data and information to overcome the problems they face when learning (Al-Hudaibi, 2012: p. 41).

First: The hypothetical thinking strategy: It is represented in a set of intertwined and complex activities and processes carried out by the brain that motivate the individual to deal with himself or with those around him when he is exposed to a stimulus that is received by one or more of the senses, resulting in a response or a set of different responses It varies according to the circumstances it is going through. Hypothetical thinking is one of the types of thinking through which the individual can use his abilities to put forward hypotheses supported by evidence, unleash his thinking, and scrutinize and deliberate in making judgments (Abdul-Malik, 2012: p. 230).

Second: The Reverse Thinking Strategy: The strategy of applying symbolic systems depends on guiding students to start from the end, reverse the results of the situation, or break out of the norm, i.e. by looking at the situation or event in reverse, as the students' vision of events and situations deepens and thinking behind them, and thus transfers from knowledge The acquired thinking leads to thinking and thus gives a new vision, that this type of thinking helps students to realize the relationships that exist between concepts and situations, and develops the ability to have a holistic view of them through a more profound view of the situation so that if something changes in the situation presented in the read text, whether Advance, delay, or difference in the order of results, so the student realizes the changes taking place in the entire subject of the lesson according to this change (Ibrahim, et al., 2014: p. 128).

Third: The strategy of applying the different symbolic systems: It means the use of different symbolic systems in learning situations, in order to better understand the elements of the educational situation, link its parts, and express them in its own way, through planning, equations, or graphics that illustrate the links and relationships between the components of the situation. And when the teacher uses this strategy in teaching, he should ask the student to draw a map or lines that express a sequence of situations or events, or convert textual information into diagrams and equations, or summarize specific content in a tiered chart in which the content is displayed (Muhammed, 2018: p. 135).

Fourth: Similarity strategy (symmetry): This strategy depends on finding relationships between things in terms of similarity and difference, increasing the realization of the mind and branching out into thinking as a result of clarifying the relationship between the elements. This strategy supports the opportunity to search for relationships between things and works to activate mental abilities and the workings of the mind (Al-Hudaibi, 2012: p. 45).

Fifth: The fifth strategy: Analysis of the point of view: This strategy pushes the student to think about his opinions and beliefs, as the point of view expresses what the teacher believes in terms of ideas, principles, values and opinions in various situations, which in turn affect his vision of things and his interaction with events.

Sixth: Completion strategy: This strategy depends on the presence of a natural innate motive in individuals to complete the unfinished thing. Completing things urges the student to think in multiple directions (the branching of his thinking) to try to find and define relationships between the existing elements, so that it helps him to know the missing element, or Finding a relationship between events that helps him predict what might happen. - Deleted (Muhammad and Abdel Azim, 2011: p. 265).

Seventh: The Seventh Strategy: Network Analysis: This strategy aims to analyze events that have many results, or different and complex phenomena, through a series of examples about the relationships that constitute the event, the different phenomena. To determine the interrelated relationships and outcomes of events, and to know how each of them relates to the rest of the elements. The discovery and analysis of this network of events, relationships and phenomena is considered as training and exciting brain cells to form branches of neurons (Ibrahim et al., 2014: p. 130).

Advantages Of Divergent Thinking Strategies

1- Creating a rich learning environment that encourages open and unconventional thinking in the learning process.
2- Activating the role of the student and his positive participation in learning situations, making him the focus of the educational process.
3- Develop the student's sense of responsibility for his learning, as he reaches knowledge by himself, which increases his confidence in his abilities.
4- Develop thinking and creativity, as it helps the student to generate new ideas to help him adapt to the changes taking place around him.
5- Helping the student to move from the stage of acquiring knowledge to the stage of employing it in the investigation and treatment of real problems.
6- Acquisition of problem-solving and social skills.
7- It is suitable for different educational stages.
8- Develop values such as respect and the attitudes of others.
(Atiya, 2010: pg. 98)

The Teacher's Role in Divergent Thinking Strategies

1- Creating the appropriate classroom climate for cooperative learning to provide social interaction.
2- It avoids threats during learning and gives students the opportunity to express their opinions by providing them with a safe environment that helps launch creative ideas.
3- Revealing the learning styles, methods and brain abilities of the students.
4- Giving students an opportunity for mental alertness.
5- Enabling students to deal with scientific and social problems.
6- Forming groups to discuss the answers and participate in decision-making, and the role of the teacher is the guiding guide.
7- Make a review for all aspects of the educational situation, and benefit from it in the following situations.
(Soliman, 2014: pp. 73-74)

The Student's Role in Divergent Thinking Strategies

1. Responding to the questions posed by the teacher with him to reach the results.
2. Discussing and exchanging ideas with the teacher and students to help retain the information and knowledge that was obtained and apply it in new situations.
3. Realizing the similarities and differences between the elements of the lesson material.
4. Awareness of the relationships and correlations between concepts, theories and principles and simplifying them to develop new mental skills.
(Al Hanan, 2013: p. 33).

Previous Studies of Divergent Thinking Strategies

A study (Ahmed 2017): aimed at the effectiveness of a program based on divergent thinking strategies and thinking maps on developing achievement and visual thinking in mathematics for secondary school students. The study sample was (50) first-year secondary school students. An achievement test and a visual thinking test were prepared, and between the results there is a statistically significant difference between the mean scores of the experimental group and the control group in the visual thinking achievement test in favor of the experimental group.

Study: (Yaghmour, 2016): The aim of the study was to identify the effectiveness of divergent thinking strategies in teaching mathematics on developing the achievement of third grade students. The sample amounted to (97) male and female students in the third grade of primary school. An achievement test in mathematics was prepared, and the results showed that there were statistically significant differences between the mean scores of the students of the experimental and control groups in the post application of the achievement test in favor of the students of the experimental group.

Mental Flexibility:

Mental flexibility is divided into two main parts: Adaptive flexibility: It is the ability of a person to change his way of thinking in facing and solving problems, and this is by getting out of the framework of traditional thinking or adherence to a specific framework of thinking and away from mental rigidity. It also expresses the individual's ability to analyze and formulate in the face of his daily life in a flexible and innovative way. It can be said that adaptive flexibility includes changing the individual's vision when confronting developments about the problem he would like to solve in an attempt to reach a solution.Automatic flexibility: It is one's ability to move from one idea to another related to a problem that you face automatically and without being restricted to a specific framework of thinking, and it is the ability to create the largest number of unconventional ideas towards a situation in a short time. Spontaneous flexibility can be measured by the speed at which ideas are transferred and produced according to one's emotional and mental readiness for the situation.The importance of mental flexibility Mental flexibility is of great importance in learning and achieving goals, whether at the professional or academic level, and its importance is manifested in that: It indicates how easily a person changes his mental orientation if any developments occur regarding a situation, and the extent to which this contributes to positively solving problems. It contributes to helping learners to organize the process of obtaining knowledge and its procedures if they are implemented in the process of modern education, and it also helps the learner to employ what he has learned in solving various problems. Contribute to the diversity of one's ideas and make him deviate from the framework of traditional thinking in creating his ideas. Creativity is essential to getting things done successfully. It gives the ability to face problems smoothly, spontaneously, and in unconventional ways (Yousef, 2020: 19).

RESEARCH METHODOLOGY AND PROCEDURES

The researcher adopted the experimental method, and the researcher prepared the experimental design with two equal groups, the first experimental and the other. In studying the experimental design with partial control, the researcher relied on two groups, the first (experimental), which was studied according to the forked strategies, and the second was a random control group, which was studied according to the traditional method.

Third: The Study Population and Its Sample:

Studypopulation: The population of the current study is identified with second-grade intermediate students in our middle schools affiliated to the Ramadi District Education Directorate for the morning school year 2020-2019. The number of female students of Al-Shumukh Secondary School for Girls in which the second intermediate grade is (68) students before exclusion) is divided into two divisions. Only the students who failed were statistically excluded, leaving 32 students in each group.

Fourth: The equivalence of the two research groups: The equivalence was achieved in the extraneous variables shown in the following table, in addition to the equivalence in the achievement level of the parents of the study sample.

Table (1) values for the mean and variance T-value calculated and tabulated for the five variables

The group	**Experimental (30) students**		**Control 30) students**		**T-test at (0.05)**	
Variables	**the middle**	**variance**	**the middle**	**variance**	**Tabular**	**Calculated**
Cognitive flexibility	**168.12**	**121.12**	**167.22**	**113.51**	**2.00 At a degree of freedom of 60**	**0.455**
Chronological age	**62.89**	**151.49**	**61.98**	**152.11**		**0.405**
Previous knowledge	**6.34**	**11.17**	**5.12**	**21.16**		**1.662**
IQ score	**22.11**	**39.73**	**20.12**	**37.16**		**1.758**

It is clear from the table that all the calculated values are less than the tabular value (2.00), that is, the two groups are equivalent in the search variables.

As for equivalence with the parents' achievement variable, the researcher will use the chi-square test (X^2) after obtaining the information through a form distributed to the students. The calculated values of the differences for fathers were (5.113), and for mothers (4.563), and they were less than the tabular value (7.82).

Research Requirements:

1- **Scientific subject:** Before starting the experiment, the researcher determined the scientific subject that will be studied in the experiment, and it included (the three chapters of the book of social studies).

2- **Formulation of behavioral objects:** The researcher used the student's book to formulate behavioral goals for the levels (remembering, understanding, application) in light of the three chapters, which numbered (120) behavioral goals (62 remember, 44 understanding, 14 application). This is for the purpose of relying on it in preparing the teaching plans for those subjects and in building the final achievement test.

3- **Preparing daily teaching plans:** Two types of plans were prepared, experimental and control, and the plans were presented to a group of arbitrators, specialists in teaching methods, and history teachers for some middle and secondary schools. The percentage of agreement between them was adopted at (80%) and above to approve the goals and plans. The goal is valid to measure a certain level if it obtains an agreement percentage (80%) or more from the experts' opinions, and in light of this percentage, the amendment was made to those plans in order to reach their final version.

4- Setting up the search tool:

First: The achievement test: The test items were formulated (in the form of multiple choice with four alternatives) consisting of (40) items based on the optional map (specification table), Table (2):-

Educational Content	**content ratio**	**Goals ratio**	**Cognitive levels**			**Number**
			Memory52%	**Understanding 37%**	**Application 11%**	**100%**
chapter one	**18**	**38%**	**8**	**6**	**2**	**16**
Chapter two	**10**	**20%**	**4**	**3**	**0**	**7**
Chapter three	**20**	**42%**	**9**	**6**	**2**	**17**
Total	**48**	**100%**	**21**	**15**	**4**	**40**

Exam Map for Achievement Test

The validity of the achievement test: The research investigated two types of tests.

- **Apparent honesty:** The researcher relied on the opinions, suggestions and directions of the arbitrators, and all opinions were taken from amendments to the paragraphs, and accordingly this test was considered apparently honest.
- **Content validity:** because the specification table was used in setting the test items, it has achieved content validity, because one of the benefits of the specification table: It provides high validity for the test. Because through it, the researcher is forced to distribute his questions of the material in its various parts to all objectives (Al-Rawashdah et al. 2000: 12).

Statistical Analysis of The Achievement Test Items:

The test was applied to an exploratory sample of first-grade average students from Al-Thwar School (30) students. After correcting the answers, the students' scores were arranged in descending order, and were divided into two groups (15) degrees representing the upper group (15) degrees representing the lower group to find the coefficients of ease and difficulty (which ranged between 0.33-0.69) and Excellence (ranging between 0.31-0.42),The difficulty criterion was adopted between (0.20-0.80) (Al-Nashif, 2001,: p. 152), and the coefficient of distinction whenever it was more than (0.39) was considered good (Al-Nashif 2001: p. 155), and the reliability coefficient) which adopted the split-half method and using the (Pearson) correlation coefficient. The stability coefficient between the two halves was extracted and its amount was (0.81), then it was corrected by the (Spearman-Brown) equation, and it amounted to (0.895), and the test time was calculated (45) minutes.

Cognitive Flexibility Scale

The (Al-Mayahi and Radi, 2019) scale prepared for high school students and consisting of (30) items on a scale with four alternatives was adopted, and it has honesty, stability and other characteristics, and thus the highest score on

the scale is (120) degrees and the lowest score is (30) degrees, with an average Hypothetical (75) degrees.

Second: Research Results and Their Interpretation

Results related to the first null hypothesis:

The table shows the arithmetic mean, variance and T-value (calculated and tabular) for the scores of the two research groups in the achievement test.

The group	The number	Arithmetic average	Variance	Degree of freedom	T-Test		Statistical significance
Experimental	**32**	**30.21**	**27.16**	**62**	**calculated**	**tabular**	**Significant**
Control	**32**	**23.21**	**15.32**		**8.164**	**2.00**	**0.05**

That is, there are statistically significant differences at the level (0.05) between the average scores of the experimental group and the control group in favor of the experimental group.

This indicates the superiority of the experimental group students who studied according to the divergent thinking strategies over the students of the control group who studied the traditional way of teaching in the achievement test.

The effect size was calculated according to the following equation for the t-test:

$$\eta^2 = \frac{t^2}{t^2+df} = \frac{(\mathbf{8.164})^{\mathbf{2}}}{(\mathbf{8.164})^{\mathbf{2}}\mathbf{+62}} = 0.518$$

In comparison with the reference table according to the subject literature, the effect size is large. If the value of (η^2)is greater than (0.14), the effect size is large.

Results Related to The Second Null Hypothesis:

The table shows the arithmetic mean, variance and T-value (calculated and tabular) for the scores of the two research groups in the achievement test.

The group	The number	Arithmetic average	Variance	Degree of freedom	T-Test		Statistical significance
Experimental	**32**	**93.55**	**107.42**	**62**	**calculated**	**tabular**	**Significant**
Control	**32**	**80.65**	**115.87**		**6.686**	**2.00**	**0.05**

That is, there are statistically significant differences at the level (0.05) between the average degrees of flexibility, the experimental group and the control group, in favor of the experimental group.

This indicates the superiority of the students of the experimental group who studied according to the divergent thinking strategies on the scale of flexibility over the students of the control group who studied in the traditional way of teaching. And when finding the size of the effect on elasticity,

$$\eta^2 = \frac{t^2}{t^2+df} = \frac{(6.686)^2}{(6.686)^2+62} = 0.418$$

Which indicates the size of the effect is also large on the elasticity scale>

RESULTS

The results of the research, represented in the use of divergent thinking strategies in social studies, revealed that it had a positive impact on the educational outcomes of the experimental group students compared to the control group. It showed, with statistical significance, to raise their scientific level in the achievement test and the measure of flexibility that took place immediately after the end of the experiment.

The result of the superiority of the experimental group students over their peers from the control group in the post-achievement test and the flexibility scale is due to:

1- Teaching according to this strategy provides the students with the opportunity to build their knowledge through positive interaction with the teacher, as well as the interaction between the students themselves, communicating with each other using their own thinking processes, and demonstrating their awareness and their ability to be good models in thinking through dialogue, use of expressions and exchanging Opinions that may interest female students and advance their scientific level to the maximum of their abilities, potential and ability.

2- The positive impact of the divergent thinking strategies and the nature of their questions encourage understanding of situations and help in determining meaning, which may help increase achievement.

3- Divergent thinking strategies are among the modern models that are based on the constructivist theory.

4- This strategy reduces the introversion and isolation of a number of female students, and reduces the state of fear of failure in another number of them, through the female students playing their roles within each group, and in front of the female students in the class, which enhances their awareness and awareness of the answer and increases their cognitive flexibility.

5- Divergent thinking strategies helped to link the previous information possessed by the students in their knowledge store with the subsequent information and to build it in an integrated manner, and this is consistent with the study of sociology, especially as it is a cumulative educational material in which the new topics depend on the previous topics. Which has the greatest impact on understanding and assimilation of the study material and creating real (meaningful) learning for students, which contributed to keeping it for a long time and easy for him to remember.

In The Glare of The Findings of The Research, The Following Was Concluded:

1- The positive effect of divergent thinking strategies as a method of teaching in increasing the achievement compared to the traditional method among second intermediate students.
2- The positive impact of divergent thinking strategies on the cognitive flexibility of second intermediate female students.
3- Teaching using divergent thinking strategies to a large degree encourages students to be free to think, express what is going on in their minds of questions and answers, identify errors and correct them, as well as encourage their positive participation during the lesson (through the researcher's observation during the application of the experiment) and this is an indication that they have the internal motivation to learn, which Increases achievement and cognitive flexibility.

ARABIC AND FOREIGN REFERENCES AND SOURCES:

Ibrahim Ahmed. Mahmoud, and others (2014) The effectiveness of a program based on divergent thinking strategies for developing creative reading comprehension skills and some habits of the productive mind among first-year secondary students, Journal of the College of Education in Assiut, Volume (30), Issue (4), Egypt, p. 116-165.

Ahmed, Samah Abdel Hamid Suleiman, 2017, the effectiveness of a program based on divergent thinking strategies and thinking maps on developing achievement and visual thinking in mathematics for secondary school students, Journal of the College of Education, Al-Azhar University, Egypt, No. (175), Volume 1, p. 12-72.

Jassim, Wissam Abdullah, and Razzouk, Haider Abdul-Amir, (2020), Curricula and Methods of Teaching Social Studies in Iraq: A Critical Evaluation Study, The Arab Journal of Specific Education, Volume (4), Issue (3), May, p. 61-98.

Al-Jughayman, Abdullah Mohammed Ahmed. (2018). The Comprehensive Guide to Designing and Implementing Talented Education Programs, Obeikan Publishing and Distribution, Riyadh, Saudi Arabia.

Al-Hudaibi, Ali Abdel Mohsen, (2012), The Effectiveness of Divergent Thinking Strategies in Developing Rhetorical Concepts and the Attitude towards Rhetoric among Learners of Arabic Language Who Are Speakers of Other Languages, Journal of Arabic for Speakers of Other Languages - Institute of Arabic Language at the International University of Africa - Sudan, Issue (14).

Elhanan, Taher Mahmoud. .(2013). A proposed unit for teaching history using divergent thinking strategies in developing decision-making skills and historical awareness of the history of Jerusalem for second year preparatory students. Journal of the Educational Society for Social Studies - Egypt. P.75 - 13.

Khammas, Nagham Falah, (2018), The Effectiveness of Using Differential Education in Acquiring History for Fifth Literary Grade Students, Journal of the College of Basic Education for Educational and Human Sciences, Babylon, Issue (37), February.

Suleiman, Tahani Muhammad, (2014), a training program based on divergent thinking strategies to develop the teaching performance of science teachers and the generative thinking of their students, Journal of Scientific Education - Egypt, Volume (17), Issue (2).

Amer, Tariq Abdel-Raouf Mohamed (2020). Society's needs and future challenges, Dar Al-Yazuri Scientific Publishing and Distribution, Amman, Jordan.

Abdel-Bar, Abdel-Nasser Mohamed Abdel-Hamid, 2019, a proposed teaching model based on the theory of brain-based learning for the development of deep understanding and meta-cognitive skills and meta-cognitive skills for third-grade preparatory students, Journal of the College of Education, Menoufia University, issue (1), p. 100 - 151.

Abdul-Malik, Loris, (2012), Developing the skills of information generation and evaluation, and cognitive achievement in biology among secondary school students using teaching strategies that encourage neural bifurcation, Journal of Scientific Education, Volume (15), Issue (2), pp. 203-248.

Attia, Mohsen Ali, (2010), Metacognitive Strategies in Reading Comprehension, Dar Al-Manar.

Alwan, Inside Muhammad, 2016, The Unit Method in Teaching Social Studies (Analytical Study), Ahl al-Bayt Journal, Peace be upon them, No. 19, pp. 527-552.

Muhammad, Hanan Mahmoud, (2018), The Effectiveness of Using Divergent Thinking Strategies in Teaching Biology to develop reflective thinking skills and self-regulation for learning among secondary school students, Journal of Scientific Research in Education, Issue (19), p. 123-158.

Youssef, Iman Ahmed. (2020). Administrative skills and ways of developing them, Dar Ibn Al-Nafis for Publishing and Distribution, Amman, Jordan.

Sahin, Ertugrul, et al, (2018), Predictors of Academic Achievement among Physical Education and Sports Undergraduate Students, Sports 2018, 6, 8; doi.

Yaghmour , M (2016) , Effectiveness of Neural Branching strategies of the achievement on the achievement of third grade students' in mathematics , Journal of Education and Practice , V.13 , N.8 , PP: 231 – 250.