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The Impact of the strategy of Guided Imagination in academic achievement of Second Grade Female Students in Chemistry and Visual Intelligence

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Abstract

The study aimed to know the effect of using the guided imagery strategy in the achievement of second grade students in chemistry and visual intelligence, and the sample of the study consisted of (44) students from the second grade average students were distributed to two experimental groups (22) and a control group (22). Reward the two groups in the variables: (the average achievement of the first course grades, chronological age in months, intelligence test, previous information). To achieve the objective of the study, an educational material was adopted according to the strategy of guided imagery and visual intelligence testing. After calculating psychometric properties, the data were treated statistically using SPSS statistical program. The results showed that there is a statistically significant difference between the students of the experimental group who studied according to the guided imagination strategy and the students of the control group who studied according to the traditional method of achievement and visual intelligence for the experimental group. Accordingly, the researchers recommend the adoption of a strategy of guided imagery in the teaching of chemistry, and propose to conduct further studies of different stages and subjects to learn their impact on science fiction and visual intelligence.

El Impacto De La Estrategia De La Imaginación Guiada En El Rendimiento Académico De Las Estudiantes De Segundo Grado En Química E Inteligencia Visual

Resumen

El estudio tuvo como objetivo conocer el efecto del uso de la estrategia de imágenes guiadas en el logro de los estudiantes de segundo grado en química e inteligencia visual, y la muestra del estudio consistió en (44) estudiantes del promedio de estudiantes de segundo grado distribuidos en dos grupos experimentales (22) y un grupo de control (22). Recompense a los dos grupos en las variables: (rendimiento promedio de las calificaciones del primer curso, edad cronológica en meses, prueba de inteligencia, información previa). Para lograr el objetivo del estudio, se adoptó un material educativo de acuerdo con la estrategia de imágenes guiadas y pruebas de inteligencia visual. Después de calcular las propiedades psicométricas, los datos se trataron estadísticamente utilizando el programa estadístico SPSS. Los resultados mostraron que existe una diferencia estadísticamente significativa entre los estudiantes del grupo experimental que estudiaron de acuerdo con la estrategia de imaginación guiada y los estudiantes del grupo de control que estudiaron de acuerdo con el método tradicional de logro e inteligencia visual para el grupo experimental. En consecuencia, los investigadores recomiendan la adopción de una estrategia de imágenes guiadas en la enseñanza de la química, y proponen realizar más estudios de diferentes etapas y temas para aprender su impacto en la ciencia ficción y la inteligencia visual.

Research problem

In recent years, statistics and educational studies have shown that the level of achievement in chemistry is declining and increasing the percentage of repetition, which constitutes a waste in public funds as well as in human energies. This indicates that there is a lack of understanding of chemistry and its essentials, especially among middle school students. Research, study and thinking of teaching students at that stage in a manner consistent with their interests and thinking style, especially since most students have a very great interest in fantasy games and adapt them to the virtual reality of many of those games, teaching science fiction is a must. N Race scientific progress and explore the future has become a reality and that any mother

wants the advancement and progress must enter this race from the wider doors.

Therefore, the problem of the research can be determined by the following question: What is the effect of using the guided imagery strategy in the achievement of second grade students average in their chemistry and visual intelligence?

research importance:

The problems faced by students and the inability to employ the impact of learning in new situations and their growing numbers and the growth of scientific knowledge are a burden on educational institutions to face the complexities of this era, so the need to use the strategies and methods of learning that are not traditional to be able to achieve better results that can The design of education is a systematic design that adapts the learning-learning process to suit students 'needs, mental abilities and inclinations (Obeid et al., 2001: 23). Perhaps the importance of teaching in science fiction is that it raises students' imagination and broadens their understanding and ability. They are important for creativity, innovation and invention by drawing mental images. These mental images affect the brain and the perception of new ideas. Spatial relationships, through the acquisition of information, processing and storage and then retrieved visually, and its strength lies in the integration of vision, imagination and drawing in an active interaction where the thinker visually employ these three processes in a way that helps him to To move while thinking of imagining another, and they can consider the chemical from multiple angles of the facts, making it easier for them retrieval.

Mbo Saidi and Al Balooshi, 2011, stated that the objectives of the guided imagery strategy are:

1 - Development of the capabilities of three-dimensional imagination and thinking space (visual).

2 - approximation of abstract concepts, and the exact processes of different phenomena.

3 - to enter the worlds of atoms, molecules and minutes of the formation of matter.

4 - increase their ability to think of many phenomena in depth and look for an interpretation based on the relationships between the precise formations of matter.

5 - real pleasure for learners are applied to give a kind of change to the teaching of chemistry.

6 - Development of metacognitive abilities such as control of attention and

focus and thinking in thinking.

7 - exercise learners to clear the mind and dispel anxiety.

8 - Enrich the mental images of learners, which is the basis for the process of generating creative ideas.

9 - Develop the motivation of learners to change the routine and give them a sense of the huge stock of mental images they store.

10 - Development of multiple intelligences, including optical visual intelligence through the imagination of stereo entities such as atoms and molecules and try to rotate and replace and other space movements, as well as through the construction of different mental images. "(Ambo Saidi and Baloch, 325: 2011).

The researchers believe that visualization and drawing mental images develop visual intelligence, one of the types of intelligence that Gardner described in the list of primary multiple intelligences, and visual intelligence is no less important than linguistic intelligence and mathematical logical intelligence, which focuses on the traditional theory of intelligence, and visual intelligence plays an important role in the educational process where Helps students visualize and use this imagination to create new useful works for students. Because imagination is a learning and teaching through which the enormous potential of the human mind and mind are exploited in imagining and foresight in various learning topics because it helps the student to form mental images through mental construction and visual intelligence (Al-Saeed: 120, 2015).

Research Objective:

The current research aims to verify: -

The Effect of Guided Imagination Strategy in Achieving Second Grade Intermediate Students in Chemistry and Visual Intelligence.

Research hypotheses:

To achieve the objectives of the research formulated the following hypotheses:

1 - There is no statistically significant difference at the level (0.05) between the average scores of students who study chemistry according to the guided imagery strategy and the average scores of students who study chemistry according to the usual method of achievement test.

2 - There is no statistically significant difference at the level (0.05) between the average grades of students who study chemistry according to the strategy of guided imagery and the average grades of students who study chemistry according to the usual method in the scale of visual intelligence.

search limits:

The search is determined by the following:

- 1- Second grade intermediate students in one of the public secondary schools (daytime) mixed government of the Directorate General of Education Baghdad Karkh / 3.
- 2 - chapters (fifth, sixth, seventh) of the book of chemistry for the second grade intermediate approved for the academic year 2015-2016.
- 3- The second course of the academic year 2015/2016.

Define terms:

Guided Imagination Strategy: (Ombo Saidi and Al Balooshi 2011) defined it as:

It is based on the formulation of a fictional scenario that transports learners on an imaginary journey, urging them to build mental images of what they hear, and are directed to form mental images rich in colors of varying sizes, and is working on the integration of the five senses are integrated smell and taste and a sense of heat, touch and sound within the mental images It was built. (Lambo Saidi and Baloch, 2011: 323).

Procedural Definition:

A strategy by the teacher to formulate a fictional scenario that takes the mentally learners through a fictional journey and urges them to build mental images of what they hear and arouse their senses to integrate with the mental image and access to understand chemical information based on their visual intelligence.

Collection: Arafa (Abu Gado, 2003) as: -

The outcome of what the student learns over a certain time and can be measured to the degree obtained by the student achievement test in order to know the success of the strategy followed by the teacher and plans to achieve his goals and up to it. (Abu Jadu, 2003: 469)

Procedural Definition:

The outcome of what the student has learned after the educational situations defined by a certain period of time, which can be measured to the degree obtained by the student achievement test prepared for this purpose.

Visual Intelligence: He knew (Jaber, 2003) that:

Is the ability to accurately perceive the visual spatial world, which includes and requires sensitivity to color, line, shape, nature, field or space and the relationships that exist between these elements and includes the ability to visualize, and to represent the individual and graphically visualize visual or spatial ideas, and to orient himself appropriately in the matrix Spatial. (Jaber, 11: 2003).

Procedural Definition:

It is the ability of the student to perceive the world visually and spatially and his ability to understand the relationship between line, color, shape, nature and space through visual perception.

Theory Background:**Guided Imagination Strategy:**

Imagination of the activities carried out by the individual in various areas of life and has great importance in the formation of mental images. Imagination is a movement arising from the sense and perception that is the origin of imagination and it is a dynamic process. Imagination when Plato is a self-drawing of things perceived sense as information becomes a material for thinking, which performs two functions:

- 1- Recover images of senses.
- 2 - the use of sensible images in thinking.

He explains that it is the function of the mind and body (Saadi, 2016: 27), where the guided imagery strategy is developed by a scenario based on the teacher imagination, and students take a journey imagining urging them to build and form many mental images or meditation in the series of events that read They are used by the teacher, using a range of senses: sight, hearing, smell, taste, emotions, and sensations (Al-Jadba, 23: 2012). On the composition of mental images are related to the subject of learning and aim of vinegar The mental perceptions directed to the enrichment of scientific material. (Kazem, 160: 2011).

Ombo Saidi and Al-Balooshi (2011) point out that the visual potential provided by the guided imagery strategy expands students' imaginary perceptions and helps them to form clear mental images of chemical compounds and processes that are not visible to the naked eye. It is abundant in many micro-entities such as atoms, electrons, protons and other minutes that become incomprehensible to the student and dry concepts and mental indigestion unless they have clear mental images can deal with clearly (Ambo Saidi and Baloch, 2011: 511). It helps to strengthen memory, because when an individual imagines visually, acoustically, dynamically or in any other way, it enables him to remember more easily and recall and retrieve information (Saadi, 2016: 37).

Therefore, researchers believe that the teaching of chemistry according to the strategy of guided imagery is an important platform for the launch of multiple intelligences, the most important of which is visual intelligence and the development of creative intellectual abilities. This is shown through educational literature and scientific heritage that all scientists inventions

were based on imagination and what scientists have done to draw mental images in their imagination.

Steps to Implement Guided Imagination Strategy:

First: the preparation of the imagination scenario The teacher prepares a scenario for the imagination that the sentences are short and non-composite so that the student can build mental images, and use simple words and understandable and within the level of awareness of students so as not to confuse as a result of the use of incomprehensible words, prefer to repeat some words such as (Higher - higher - higher, smaller - smaller - smaller) which describes the movement of objects so that the student can gradually build a mental image moving, simple pauses between phrases in order to leave room for the student to swim in his imagination and build mental images involving all the senses, a gradual return Into the classroom, experimenting with the script before The teacher before the implementation of the imaginary trip to examine the scenarios phrases if the phrase did not succeed in provoking students to build a mental image.

Second: the start of the activities of imaginary preparatory short sections of the imagination of a simple position carried out before the start of the main imaginary activity and its goal is to prepare students mentally for the main imaginary activity as well as to get rid of the dispersants that are filled with their imaginations.

Third: the implementation of imaginary activity taking into account the preparation of students and not rush to implement the imagination by introducing students to the importance of imagination in the development of thinking abilities, especially visual thinking and ask them to calm and take a deep breath and ask them to close the eye stands in front of the classroom and avoid movement and start reading the words of the scenario scenario Slowly with each statement given a suitable stop and the teacher to avoid some simple laughs as well as making late students waiting outside the class until the completion of the trip and return to class.

Fourth: After the implementation of the main imaginary activity, the teacher starts asking a number of questions to the students asking them to talk about the mental images they have built during the imaginary activity, to ask questions about the pictures they have built and not about the information contained in the imaginary scenario so as not to repeat what was mentioned in the scenario. Imagine literally, welcoming all the answers and fantasies and listening to them with interest, trying to minimize their anxiety as well as asking them about all the senses did they experience certain smells or colors or a sense of heat or cold or taste something specific.

(Lambo Saidi and Al Balooshi, 332: 2011-334)

Visual Intelligence:

Visual intelligence emerges early in the individual at the age of (9-10) years through the ability of the individual to visualize the spatial ideas, and the perception of visual and spatial information and thinking in the movement of things and their position in the vacuum, and to see the universe accurately, and the perception of images or mental imaginations of the interior, as Shows sensitivity to colors, shapes, lines, space and relationships between those elements. (Ryan, 462: 2013) Visual intelligence depends on the forms, drawings and colors presented in the real situations and relationships involved, where the student tries through the forms, drawings, images and colors to deduce the meaning of those contents in front of him or included in the mental images formed by imagination, and that mental abilities directly related This type of thinking occurs when there is a mutual harmony between what the student sees forms, drawings, relationships, and the connection and mental products that depend on visual intelligence. (Kattami, 2010: 166)

The researchers believe that the student in the strategy of guided imagination can develop his visual intelligence by imagining and building mental images through which he can interpret and understand some chemical phenomena because possessing mental mental capabilities enabled him to convert the written language to the language of equations and symbols using mental images.

Search procedures:

Experimental design: The experimental design was selected with partial control of two equal groups, one experimental and the other two control testers for visual achievement and intelligence. Table (1)

Table (1)

Experimental design of the two research groups

Group	Variable Party	Independent variable	Dependent variable
The experimental	Courses of First Course, Chemistry in Months for Students, Mental Abilities (Raven Intelligence), Previous Information	Guided Imagination Strategy	Achievement, Visual Intelligence
Control		Normal way	

1- Research community:

Represents the current research community in the middle and high schools daytime affiliated to the Directorate General of Education Baghdad Karkh third for the academic year 2015/2016)

2- Research sample:

Dhulnurain High School was chosen randomly from the schools of the research community by lot, and two divisions were randomly assigned from four divisions, where the Division (B) was represented as an experimental group of (26) students, while the control group was represented by the (C) Division, which consists of (25) students. Dimensions of students who failed statistically, the two groups now include (22) students for each group.

Table (2)
Distribution of female students of the research sample to two groups (experimental and control)

No.	Group	Class	Number of female students before exclusion	Number of Female Repeaters	Research sample members
1	The experimental	B	26	4	22
2	The Control	C	25	3	22
Total			51	7	44

3. Equality of the two research groups:

The researchers rewarded the members of the research sample in some variables (the average score of the first course, chronological age in months, intelligence test Raven, previous information) and extracted the mean and standard deviation and using the T test equation for two independent samples of equal number. And the degree of freedom (42).

Table (3)
 Arithmetic mean and standard deviation of the scores of the experimental and control groups of the selected variables for the purposes of equivalence between the two groups

variable	The Group	Sample size	Mean	Var.	Degree of freedom			Statistical significance
Achievement rate for the first course	The Experimental	22	54.95	337.18	42	0.290	2.021	Not function
	The Control	22	55.63	284.24	42			
Age in months	The Experimental	22	104.72	203.06	42	0.545	2.021	Not function
	The Control	22	102.55	214.03	42			
KJ Test (Raven)	The Experimental	22	13.72	90.49	42	0.11107	2.021	Not function
	The Control	22	13.4	96.34	42			
Previous information	The Experimental	22	8.99	40.33	42	0.165	2.021	Not function
	The Control	22	8.63	43.29	42			

4. Preparation of Experiment Requirements:

- Determination of the scientific material: The subject has been specified B (Chapter V / Water, Chapter VI / Acids, rules and salts, Chapter VII / Carbon and some of its compounds)

- Preparation of daily teaching plans: (20) has been prepared daily teaching plan for the experimental group, which is taught according to the guided imagination strategy and the same for the control group, which is taught according to the usual method, and a model for each of them was presented to a group of experts and specialists in education and teaching methods. With all the observations in order to become more accurate and finalize.

5. Research tools:

1- Achievement test:

- The objective of the achievement test was determined by measuring the achievement of the students of the two research samples after the completion of the teaching process.

- The scientific article was specified in the three chapters (V, VI, VII).

- Preparation of a test map of the content of the subject in the three subjects of chemistry and behavioral purposes in the four levels of the field of knowledge according to the classification Bloom.

- The test consisted of (40) items of multiple choice type, with four alternatives where the paragraphs of the test were constructed and the instructions were presented.

- Presentation of the test with the instructions to answer a survey sample of (10) students from the second grade average to ensure the clarity of paragraphs and instructions to answer it.

- The test was applied to a second exploratory sample of (100) students other than the research sample for the purpose of calculating psychometric characteristics of the test.

- Calculate the difficulty coefficient of paragraphs and ranged between (0.34-0.69) which is a good difficulty coefficient.

- Calculation of paragraph discrimination factor has ranged between. (0.26-0.81) are good distinction values.

- Calculate the coefficient of stability of the test according to the equation Koder Richardson 20 and the value of the stability of the test 0.84 and this high stability and good.

- Calculation of the coefficient of effectiveness of the wrong alternatives to the paragraphs and all the values of the coefficient of effectiveness were negative, so all paragraphs were retained.

- Apply the test to the original research sample.

2- Visual Intelligence Scale:

1. The previous literature, studies, researches and measurements were reviewed.

2 - Determine the goal of the scale: aims to measure the visual intelligence of the two research groups.

3 - Preparation of paragraphs of the questionnaire: The paragraphs of the scale were constructed by the researchers where it consists of (15) paragraphs. The experts and specialists to verify its validity and virtual authenticity and sincerity of the content.

5 - Display the scale with the instructions to answer a survey sample of (10) students from the second grade average to ensure the clarity of paragraphs and instructions to answer them.

6 - The difficulty factor was calculated for each paragraph of the scale, and it turned out that the values ranged between (0.69 - 0.26), and therefore the paragraphs are acceptable.

6 - Statistical means: The research was mainly used by the SPSS package in extracting the results of the current research.

- To extract psychometric properties (Pearson correlation coefficient, T-test for two equal independent samples, Difficulty and discrimination coefficient, Koder-Richardson equation (KR-20), Cooper equation).

- T-test of two independent samples of equal number (T-test) to calculate the differences between the two groups, and to validate the hypotheses.

7. Results and Interpretation

For the purpose of verification of research objectives:

- The arithmetic mean and standard deviation of the experimental and control scores in the post-achievement test were calculated using T-test for two independent samples of equal number. Table (4).

- The arithmetic mean and standard deviation of the experimental and control group scores in visual intelligence were calculated using T-test for two independent samples of equal number, the calculated T value was found.

Table 4
Arithmetic mean, standard deviation, computed and tabulated T value of experimental and control groups scores in achievement test and visual intelligence scale

The Test	Group	No.	Mean	Var.	Degree of freedom			Statistical significance
achievement	The Experimental	22	26.86	30.88	42	3.346	2.021	Function
	The Control	22	18.36	92.81				
visual intelligence	The Experimental	22	23.09	31.7	42	5.412	2.021	Function
	The Control	22	14.90	19.37				

- Table (4) shows that the calculated T value of the total score for the post-achievement test (3,346) is greater than the tabular value (2,021) at the significance level (0.05) and the degree of freedom (42). There is a statistically significant difference at the level (0.05) between the average grades of students who study chemistry according to the guided imagery strategy and the average grades of students who study chemistry according to the normal method.

2. Table 4 shows that the calculated T value of the total score of visual intelligence (5,412) is greater than the tabular value (2,021) at the significance level (0.05) and the degree of freedom (42) and thus rejects the null hypothesis which states that A statistically significant difference at the level (0.05) between the average scores of students in the scale of visual intelligence for students who study chemistry according to the guided imagery strategy and the average degrees of visual intelligence for students who study chemistry according to the usual method.

Interpretation of the results:

1- The results showed that there is a statistically significant difference between the students of the experimental group who do not study according to the guided imagination strategy and the control group who studied according to the usual method in the post-achievement test.

2- The results showed that there is a statistically significant difference between the students of the experimental group who studied according to the strategy of guided imagery and the control group who studied according to the usual method of visual intelligence.

The researchers attributed this to the following:

- The use of guided imagination strategy, which includes motivating students to use the imagination and the virtual world in chemistry and the link between their previous information and new knowledge and the formation of new knowledge positions.

- The construction of mental images during the activity to enable students to combine forms of verbal and visual communication, which contributes to the consolidation of long-term memory and the possibility of the preservation and retrieval of knowledge.

- The use of guided imagery strategy to make students more enjoying the lesson, which helps them to accept cognitive information and make them more enjoyment of the capabilities of thinking and visual intelligence where made them more aware of the relationships between colors, shapes, movement and other senses.

- Imaginative activities and the guidance of students to draw mental im-

ages directed to make students communicate with the queen of imagination, which is owned by all but neglected by many by training learners with low abilities in visual and spatial thinking to develop their achievement of chemistry.

- Guided imagination strategy is a scientific activity at the same time that it is entertaining and well trained to make the learner use all his senses in building knowledge through the transition to the virtual world and images of mental images rich in color, shapes, taste and movement in two and three-dimensional images, making the teaching of chemistry more attractive to them.

Conclusions:

In the light of the search results it was concluded that:

1 - The use of guided imagery strategy in the teaching of chemistry for the second grade intermediate has had a good impact in the collection of chemistry.

2 - The use of guided imagery strategy in the teaching of chemistry for the second grade intermediate has had a positive impact in the development of visual intelligence among students.

Recommendations:

In light of the current research results, the researchers recommend the following: -

1 - the use of guided imagery strategy in teaching chemistry for the second grade medium because of its impact on the achievement and development of visual intelligence among students.

2 - Include the strategy of guided imagery within the vocabulary of teaching methods of the faculties of education.

3 - the need to emphasize the designers and developers of curricula and teaching methods to use strategies based on visual intelligence in chemistry.

4 - Holding developmental and training courses in the general directorates of education of the Ministry of Education for chemistry teachers and urge them to focus on science fiction and guided imagery in the methods of teaching chemistry.

5 - urging educational television and some educational means to focus on the visual side using imagination to draw mental images during educational activities.

Proposals:

To complement this study, the researchers propose the following studies:

1 - Study of the strategy of guided imagery in the teaching of chemistry and

for different stages in the achievement and visual intelligence.

2-Studying the effect of guided imagery in other dependent variables such as (conceptual acquisition, scientific thinking, conceptual change, science processes, motivation, environmental awareness).

3 - a proposed program to train teachers in service on the use of guided imagination strategy in the teaching of chemistry and the impact of their teaching practices and the achievement of students.

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