

Effect Of The Project-Based Learning Strategy On The Development Of Creative Thinking Among Female Students Institute Of Fine Arts In Interior Design

Prof. Dr. Fatima Mohammed Abdullah, Prof. Dr. Salahuddin Qaderah Mohamed and Rasha Hassan Jassim*

Mustansiriyah University / Faculty of Basic Education,

**rashammalaa@uomustansiriyah.edu.iq*

Abstract

The study aimed to identify the effect of the Project-based learning strategy on the development of creative thinking among the students of the Institute of Fine Arts in the subject of interior design. To achieve the goal of the research, the researcher used the experimental design with one group with a pre and post test of creative thinking to fit it on a sample of third-grade students of the Institute of Fine Arts. The research sample consisted of (10) students as an experimental group. To reach the results of the research, the researcher used a set of statistical methods, including : Wolcoxon test for one sample to show the results reached by the research, the Kuoder Richardson / 20 equation and the T test for two independent samples (to calculate the stability of the creative thinking test) Cohen's equation to measure the size of the effect of the gradual change strategy Spearman's corrective equation to correct the correlation coefficients for purposes of stability.

The most important results of the research showed:

- 1- That the Project-based learning strategy has made an effect on the development of creative thinking among the students of the Institute of Fine Arts in the subject of interior design.
- 2- There is a very high difference between the pre and post responses on the scale of creative thinking for the students of the Institute of Fine Arts in interior design.

Key words: Project-based learning strategy - creative thinking - interior design

Complementing the current research, the researcher proposed several proposals, including :

- 1- The effect of the Project-based learning strategy in developing the skills of the students of the Art Education Department with the subject of sculpture .

Based on the findings of the study , the researcher recommended several recommendations, including :

1. Directing the faculty in the internal design departments to pay more attention to providing enrichment and guidance programs for students that contribute to the development of creative thinking.

The most important results of the study showed:

introducing thinking development methods and tools .

From the above, the researcher believes that educational institutions complain of a clear absence in training students and teaching them the thinking skills necessary for their academic life, including creative thinking.

Seeking to use strategies such as Project-based learning strategy Project-based learning in the vocabulary of art education materials is of great importance to improve the reality of the educational process and develop the thinking of learners, because teaching thinking and its processes through the project is one of the important processes that aim to raise the level of intellectual efficiency of the student and help him solve problems, which affects his level of achievement and skill performance.

Based on the above, the problem of the current research is summarized in the following question:

What is the effect of the Project-based learning strategy on the development of creative thinking among the students of the Institute of Fine Arts in the subject of interior design? .

The importance of the research : The importance of the current research is highlighted through the following aspects:

- 1- The Project-based learning strategy is realistically relevant to life and provides a basis for understanding the topics and problems they encounter outside the school.
- 2- Enriching the theoretical frameworks in the curricula and methods of teaching artistic and special education in the field of educational programs through which various aspects of cognitive development can be developed among students of the Institute of Fine Arts .
- 3- The results of the current research may be useful in knowing the most appropriate methods used by the teacher to develop creative thinking among students of the Institute of Fine Arts .
- 4- The interior design material is an integrated series to build the components of artwork and is a subject of interest to

1. The Project-based learning strategy has an effect on developing creative thinking among the female students of the Institute of Fine Arts in the subject of interior design. The digital educational environment has contributed to increasing the skill performance scores of the students of the experimental group.

2. There is a very high difference between the two responses, before and after, on the scale of creative thinking for female students of the Institute of Fine Arts in the subject of interior design.

Based on the findings of the study, the researcher recommended several recommendations, including:

1. Directing the faculty in the interior design departments to increase interest in providing enrichment and guidance programs for female students that contribute to the development of creative thinking.

To complement the current research, the researcher suggested several proposals, including:

1. The effect of the Project-based learning strategy on developing the skills of art education students in sculpture.

Chapter One

The problem of research : Education is the basis of the success of the individual and society. It aims to develop the mental abilities, readiness and skills of the individual, and to raise a generation capable of adapting to the age of the knowledge explosion and facing contemporary problems effectively. Education is the means of education in achieving its objectives and an important source in building the human personality. Education strikes a balance between the needs of the educated individual and the requirements of the comprehensive development of his society.

Despite the importance of thinking skills of all kinds, including creative thinking skills, a number of studies showed the lack of interest and focus on these skills within the classrooms such as Aziz, 1998, and Al-Khafaji and Al-Obaidi, 2002, as the Arab school was satisfied with indoctrination and did not succeed in

Term Definition :

The **Project-based learning strategy** : **Omar (2010) defined it as** : Any field work carried out by the individual and characterized by practicality and under the supervision of the teacher and is purposeful and serves the scientific material, and to be carried out in a social environment, students choose projects themselves and feel a sincere desire to implement them. (Omar , 2010 : 46) .

Procedural definition: A manual or mental field work inside or outside the school that is planned to achieve specific goals and is carried out in a social setting to address a specific problem, preferably collectively.

Fifth : Creative Thinking

Adibi (2001) defined it as: "the individual's ability to produce, the production characterized by the greatest possible intellectual fluency, spontaneous flexibility and authenticity as responses to an exciting problem or situation" . (Adibi, 2001 :85)

Procedural definition: It is the mental activity practiced by the students of the Institute of Fine Arts when evoked by the paragraphs of the Creative Thinking Test, which leads to the production of as many different, varied, new and unfamiliar ideas as possible and is estimated by the total degree obtained at the levels of creative thinking. (Fluency, Flexibility, Authenticity) .

Since creative thinking includes (fluency, flexibility and originality), the researcher believes that it is necessary to review some of the definitions that clarify these sub-terms :

1- Fluency :

Muhammad(2002) defined it as :

"the multiplicity of ideas that an individual or creative student can bring to a given unit of time" . (Muhammad, 2002 : 44) .

Procedural definition:

It is the ability of the students of the Institute of Fine Arts to produce as many ideas and alternatives as possible that are quantitative when responding to the paragraphs of the creative thinking test and

arts teachers in general and design teachers in particular.

Objectives of the research :

- 1- You know the effect of the Project-based learning strategy in the development of creative thinking among students of the Institute of Fine Arts in the subject of interior design.
- 2- Measuring the size of the effect BApplying the strategy to a sample of third stage students (Institute of Fine Arts) .

Research hypotheses: To achieve the objectives of the research, the researcher formulated the following zero hypothesis:

- 1- "There are no statistically significant differences at the level of (0.05) in (fluency) for the experimental group in the pre- and post-tests .
- 2- "There are no statistically significant differences at the level of (0.05) in the (flexibility) of the experimental group in the pre- and post-tests .
- 3- "There are no statistically significant differences at the level of (0.05) in (originality) of the experimental group in the pre- and post-tests .
- 4- "There are no statistically significant differences at the level of (0.05) in (creative thinking) of the experimental group in the pre- and post-tests .

Research limitations:

Spatial limits : Institute of Fine Arts for Girls / Karkh 1

Human Limits: Grade 3 /Morning Study Students

Temporal Limits : Academic Year 2021/2022

Objective limits: Adopting the Project-based learning strategy in teaching the subject of interior design, which was prepared and presented by the researcher herself .

on a carrier medium, according to the concepts of purpose and measurement) .

CHAPTER TWO:

Project-based learning strategy : The idea Project-based learning strategy Project-based learning emerged as one of the strategies that depend on learning centered on the learner, as educational studies emphasize the importance of this type of learning patterns in achieving integration between the branches of subjects in the same discipline, or different disciplines so that the learning output appears in a picture that reflects the learning objectives of more than one subject, and it also works on linking study programs to work and production sites and emphasizing the integration between what students study in school and the practical reality in the labor market. (Hammam, 2012 : 84)

The Project-based learning strategy can be adopted significantly in teaching the subjects of education, as this method is almost limited to the scientific aspects that include performance skills such as design, handicrafts and technology applications. (Klapatrick) has introduced the project method of teaching by translating ideas about the development of educational curricula in a practical and applied manner in the form of work projects related to the lives of students and their needs. We can perform projects by individual or collective work in light of the available possibilities and the nature of the project requires individual or collective effort. It must be taken into account that there are individual and collective projects with the aim of recognizing the student's right to his individuality and self-emphasis and identifying the strengths and weaknesses of his personality on the one hand and helping him to acquire social skills that facilitate the means of engagement and integration on the other hand. (Al-Hanaki, 2012: 92) .

estimated by the total degree of the sum of these ideas .

2) flexibility:

Groan (1999) defined it as :

“The ability to generate diverse ideas is not the type of ideas normally expected, directing or diverting thinking as the stimulus changes or the demands of the situation” . (Jarwan, 1999 :98)

Procedural definition

It is the ability of the students of the Institute of Fine Arts to produce as many diverse and new ideas as possible through its response to the paragraphs of the creative thinking test and is estimated by the total score of all these ideas .

3- Authenticity :

Adibi (2000) defined it as :

"The ability to produce original responses, that is, low frequency in the statistical sense within the group to which the individual belongs, that is, the less common the idea is, the more authentic it is." (Adebi, 2000: 86)

Procedural definition:

It is the ability of the students of the Institute of Fine Arts to produce as many original and new ideas as possible that are less frequent or common by responding to the paragraphs of the creative thinking test, which can be estimated under the correction key or given a certain percentage.

Sixth : Interior Design :

Amer (2004) defined it as :

Preparing the interior space to perform functions with minimal effort, including floors, walls, ceilings, furniture, materials, accessories and lighting. (Al-Amer , 2004 : 5)

Procedural definition:

The researcher adopts the definition of a mediator, which is :

(Planning , organizing, coordinating and contextualizing work to direct technical work

goes through a number of successive and interrelated stages:

- 1- Choosing the project that stems from the needs of students and its suitability to their level, ability, experience and potential
- 2- Planning the project by defining the objectives, activities and quality of participation if it is social and the time period for implementation .
- 3- The implementation phase then transforms the theoretical aspect by students into a practical and operational reality.
- 4- Evaluation of the project so that it is continuous in all stages until the end and presentation of the project in its final form. (Elsayed, 2017: 26) .

Characteristics of the Project-based learning strategy : There is a set of characteristics that characterize the Project-based learning strategy :

- 1- Meeting the **needs, tendencies and desires of students:**
2. **Projects support the integration of materials :**
- 3- **It is allowed to form social relations between students :**

Conditions and criteria of the Project-based learning strategy : There are a set of conditions required in the Project-based learning strategy :

- 1- Project-based learning strategy Project-based learning is a way to reach knowledge, understanding and skills for success through linking the project to learning objectives, content and skills .
- 2- The project is based on a real problem that requires a solution or a question that requires an answer so that students' abilities are challenged at the appropriate level for them . (Hazhuzi, 2016: 87)
- 3- The project takes place in a real-world context as it corresponds to students' interests.
- 4- Students make decisions about the project and how to implement it .

The concept of a Project-based learning strategy : It can be described as a teaching and learning strategy that depends on the student's performance of major educational tasks in realistic and life situations in his environment and requires the student to practice with his peers the tasks of planning, implementation and evaluation in order to achieve the desired results. Or that it is an instructional strategy focused on the learner, in which the learner performs alone or with his colleagues a specific task in which he acquires knowledge and skills himself under the guidance of the teacher and his follow-up, and in which the learner evaluates his work and the work of his colleagues, whether inside or outside the classroom. (Al-Hasnaoui , 2010: 79)

The basic principles of the Project-based learning strategy : -

The basic idea of learning in the project is the real problems that will attract students and encourage serious thinking to acquire and apply knowledge in the context of solving the problem. This learning can take place inside or outside the classrooms. This type of learning encourages students to be educated to have a capacity for cooperative education. (El-Sherebini, 2009: 92)

The Project-based learning strategy provides students with the opportunity and freedom to plan and implement learning activities. Then, students were given the opportunity to identify the topic, conduct research and complete some production. This strategy allows the teacher to be the facilitator and supervisor, not as a center for all learning activities. The learner was made a center for education. There are five criteria for learning in the project ,which are:

- 1- The focus of learning is the implementation of a project that is linked to real-life problems and is based on the curriculum .
- 2- Focus on questions or problems that encourage students to acquire concepts and principles .
- 3- Student participation in projects to build knowledge
- 4- Students plan, design and implement projects

The stages of the Project-based learning strategy : The Project-based learning strategy

understanding, allowing all students to work, and using accurate and clear assessments.

Step 5: Integrate skills into the project: The strong aspect of project-based learning is to enable teachers to integrate certain skills into the teaching process.

Step 6: Finding a better environment for learning: Giving the opportunity to apply the project outside the classroom, that one of the strongest influences of project-based learning can be observed when students are given real work to do outside the school in cooperation with experienced partners, partnerships can include teachers from the same school or neighboring schools or partnerships or associations and electronic links with individuals and others .

Creative thinking:

The components of creative thinking can be limited to the following aspects:

- 1- **Fluency :** It is the ability to quickly produce the largest number of ideas in a given situation. "It meets certain conditions and indicates the ability to use our knowledge stock when we need it. There are several forms of fluency, including :
 - A_ Verbal fluency: - It means the ability of the learner to generate the largest number of words
 - B_ Intellectual fluency or meaning fluency: - The ability to produce as many ideas as possible according to certain conditions in terms of meaning
 - C - Fluency of shapes: - It is the ability to quickly draw a number of shapes or provide a number of additions to certain shapes to form drawings close to reality. (Saleh, 1988: 87)
- 2- **Flexibility :** It is the change of an individual's state of mind by changing the situation, or the ability to generate diverse and unfamiliar ideas, and look at things from multiple angles. Flexibility are several forms, including:
 -
 - A) Automatic flexibility.
 - B) Adaptive flexibility.

- 5- Students and teachers reflect on the way students learn and the effectiveness of the activities they carry out and reflect on the quality of students' work and the obstacles facing them and how they overcome those obstacles . (Olive, 2002: 87)

Types of projects : The division (dog Turk) projects into four types are :

- 1- Construction Projects
2. Entertainment projects
- 3- Problem projects
- 4- Projects intended to gain skill

Steps of teaching the Project-based learning strategy :

There are a number of specific steps to follow when using the Project-based learning strategy :

Step 1 : Develop the idea of the project.

The best projects are those that focus on community service, so it is important to link the project to local and national events that interest and occupy the student at work.

The second step: Choosing the scope of the project: The projects range from short projects to a week or two and between those that require unspecified explorations and take longer, often projects require field research, interviews, visits to libraries, and investigations of interest to the community. Decisions that concern the field of activities in the project must be taken before starting it. (Al-Absi, 2013: 135)

Step 3: Determine the expected outputs in light of the general objectives:

This phase requires a milestone capable of analyzing content objectives, and formulating specific objectives in the light of general objectives.

Step 4: Build project design standards.

Good projects are based on important criteria that support the success of the project, and it must be verified whether the project achieves the proposed criteria and objectives in terms of: student participation, focusing on basic

that meet his basic needs in life or those whose adaptation leads to the ability of man to resist nature, damage and harmony with it. Abdullah, 2008: 122)

Types of designs : The types of design art can be summed up by three types:

1- Industrial design: It is an applied art where it combines beauty and usability in the design of products with quantitative production in order to improve sales.

2. Interior design: It is the development of appropriate remedies for the difficulties that hinder the field of movement within the architectural space and the ease of use of this space and the furniture and equipment it includes and make it comfortable and distinctive with its aesthetic and functional standards.

3- Printing design: It is an informational and motivational means of identification and has been found as a craft since the middle of the twentieth century where people searched for ways to give visual images ideas and store information in print and to train and clarify the information that was used by printers and sculptors .

Previous Studies:

Studies dealing with the Project-based learning strategy :

Study (Al-Hammad 2015) : Qatar

Tagged as : (The effect of using project-based learning in improving creative thinking skills in mathematics among primary school students in the State of Qatar)

Objective of the study : The study aimed to identify the effect of project-based learning in improving the creative thinking skills of primary school students in the State of Qatar .

Study method: The researcher adopted the semi-experimental approach in the study procedures to measure the effect of learning on projects in improving creative thinking skills.

Study community: Students of the fifth grade primary school in Jaber bin Hayyan School.

Flexibility is measured in more than one way, such as : revealing the number of moves from one idea to another in one context, or enumerating different types of ideas, and the degree is calculated by the number of those types. (Birch, 2001: 92)

- 3- **Authenticity** means novelty and uniqueness, and it depends on the quality of the creative output within the members of the same group, and the less common the idea is, the more authentic it is, that the individual is authentic to the extent that his response to stimuli is not common, as the original innovator in this sense means his distinctiveness, or uniqueness and not subject to what is common and traditional (Zaytoun, 1987, 24) .

Stages of Creative Thinking : The process of creative thinking takes place through four consecutive stages:

1. **The preparation stage:** It is the comprehensive and in-depth background in the subject in which the individual is creative and interpreted by (Gordan) as the stage of cognitive preparation and interaction with him .
2. **The stage of latency and incubation:** It is a state of anxiety or unconscious fear and hesitation to do work and search for solutions, which is the most difficult stage of creative thinking.
3. **Supervision stage:** It is the state in which the flash or spark that leads to the idea of a solution and getting out of the predicament occurs, and this state cannot be determined in advance, it occurs at some time, somewhere, and the spatial, temporal and environmental conditions surrounding it may play in moving this state, and many described it as a moment of inspiration .
4. **The investigation stage:** It is the stage of obtaining the original useful and satisfactory results, and acquiring the creative product on social satisfaction. (Muhammad, 2002: 2)

Interior Design

It is the outcome and set of processes that the designer achieves and influences through it in his environment to shape, formulate and adapt it in order to produce that formulation in forms

Study sample: The research sample consisted of (75) male and female students divided into three groups equally .

Study tools: Creative Thinking Test, Taste Material Cognitive Test.

Statistical means: The researcher used the statistical program (spss) to extract the results of his research , which are as follows: Univariate analysis, Pearson correlation coefficient, Cowder Richardson/20 equation, T-test, agreement ratio equation.

Results of the study: The group (S1) and the group (S2) are superior to the group (Z) in the creative thinking scale.

Studies on interior design:

Study (Al-Majdi 2011) : Iraq

Tagged: (The effect of using the slide presentation in the achievement of the design material by students of the Institute of Fine Arts) .

Research Objective: The research objective is to :

- 1- Designing and implementing proposed teaching plans using digital slide presentation in the teaching of (typographic design) in the design department of the Institute of Fine Arts .
- 2- To know the effect of the plans proposed in the slide presentation on the achievement of the students of the design department in the teaching of the subject (typographical design) .

Research Methodology: The researcher used the experimental method as a research method and adopted the experimental design called the design of the two equivalent groups (experimental and control) .

Research community: The research community may be students of the second stage of the design department/Institute of Fine Arts – Baghdad Karkh / Male, and on (Printing Design).

The research sample: As for the research sample, it consisted of (20) students distributed over two halls with (10) students in the hall (A)

Study sample: The research sample consisted of (60) students , the researcher selected (30) students from the fifth grade of primary school, a division (10) as an experimental group, (30) students from the fifth grade of primary school from a division (5) as a control group.

Study tools: Testing creative thinking skills.

Statistical means: Pearson correlation coefficient, using the Spearman-Brown equation.

The results of the study : There are apparent differences between the arithmetic averages of the performance of the fifth grade primary students on the test of the skills of post creative thinking according to the variables of the study method of teaching using project-based learning and the usual method and for the benefit of the experimental group.

Studies on Creative Thinking :

Study (Hussein 2014) : Iraq

Tagged : (The effectiveness of the six hat strategy in the development of creative thinking among students of the Art Education Department) .

The objective of the study : It aimed to measure the effectiveness of the six hat strategy with its two systems (the first) individual thought patterns and (the second) sequential thought patterns at the same time in the development of creative thinking among students of art education compared to the normal way

The study method : The researcher adopted the experimental approach, and adopted the experimental design with tight control and includes three groups, as the research sample was distributed in two experimental groups (S1), (S2) The first is studied according to the six hat strategy by adopting individual thinking patterns, and the second is studied according to the same strategy, but in the sequential patterns method (for thinking), while the control group is studied in the usual way.

Study Community: Fourth Grade Students - Department of Art Education – Faculty of Fine Arts – University of Baghdad /Morning Study

The researcher adopted the creative thinking test (Torrance) to measure the creative thinking of the students of the Institute of Fine Arts in interior design.

Test correction method

The test consists of three dimensions: fluency, flexibility, and authenticity, and each dimension has

A different correction method. The following is a brief explanation of the method of correction for each dimension:

1- Fluency

The responses must be reviewed before starting to correct the circuit drawing test, to exclude what is repeated, as well as to determine the relevance of the response to the stimulus, and to exclude what is not related to the stimulus.

The response associated with the stimulus can be defined as the one that contains or somehow uses the circuit. Fluency is calculated by taking into account all responses minus duplicative or irrelevant responses to the stimulus. (Atallah , 2005 : 26)

2- Flexibility

The degree of flexibility is calculated by adding the number of categories in which the responses are, and when determining the category, we must take into account the fee produced by the examiner, by calculating the number of categories of responses in which the fee produced can be classified such as human beings – household items – flowers – school items – celestial bodies...etc. These categories must be limited to the total sample before the grade is given. (Atallah , 2005 : 28)

3- Authenticity

The degree of authenticity is estimated on the basis of the scarcity of the response, and the scarcity here is attributed to the actual responses that emerged from the performance of the study sample. The response is repeated in proportion and as in Table (1) below .

Table (1) represents the method of estimating the degrees of authenticity

as a pilot group and (10) students in the hall (B) as a control group.

Statistical means: The statistical means were : (Wilcoxon) test, as well as the difficulty coefficient and the discrimination coefficient for the achievement test. For the purpose of identifying the significance of the differences between the two groups, the researcher used the Man Wenti test.

Research Results: The results showed that the experimental group on the slide show in the design material is superior to the control group that is studying the same material in the traditional way.

Chapter Three

This chapter includes a detailed description of the procedures followed by the researchers to achieve the objectives of the research, which are: -

Research Methodology: Since the current research aims to know the effect of the Project-based learning strategy on the development of creative thinking among the students of the Institute of Fine Arts in the subject of interior design. Therefore, the researcher followed the experimental approach in designing her research procedures because they are more appropriate to achieve the research objectives.

Experimental Design: The researcher followed the experimental two-skilled experimental design and the pre and post creative thinking test to suit the research sample

Research community: The current research community is from the students of the Institute of Fine Arts / Department of Interior Design for the academic year 2021-2022 (morning study only), the number of (66) students distributed to the institutes of fine arts , which includes the Department of Interior Design

Research sample: The research sample was chosen in a random way, and it consisted of the students of the Institute of Fine Arts /Baghdad -Karkh/1- Third Grade - Department of Interior Design, numbering (10) students.

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Chapter Four

This chapter includes the findings of the researcher and discuss them according to the research hypotheses as follows :

Findings related to the first hypothesis

"There are no statistically significant differences at the level of (0.05) in (fluency) for the experimental group in the pre- and post-tests .

The researcher applied the Loxsen test to detect the significant difference between the average group in the level of fluency. For the purpose of verifying this hypothesis, the results are listed in Table (2) .

Skill	Repeat Response	Score
Authenticity	5% or more	0
	4% - 4,99%	1
	3% - 3,99%	2
	2% - 2,99%	3
	1% - 1.99%	4
	Less than 1	5

The validity and reliability of the test has been verified

Statistical **means:** The researcher analyzed the data into systematic images for her research using the statistical portfolio of social sciences (spss))

Table (2) The arithmetic mean and standard deviation in the level of fluency of the members of the two groups

group	Testing	Num ber	arithm etic mean	standa rd deviati on	Tot al ran ks	FS-3 Avera ge level	Wolcoxon Value		Significa nce
							Calcula ted	tabul ar	
Experi mental group	Pre- assessm ent	10	15/10	2,767	1	1	1	8	Significa nt
	Post- assessm ent		31-40	5,522	54	6			

Findings on the second hypothesis

"There are no statistically significant differences at the level of (0.05) in the (flexibility) of the experimental group in the pre- and post-tests .

The researcher applied the Loxsen test to reveal the significant difference between the average group in the level of flexibility, and for the purpose of verifying this hypothesis, the results were included in the table .

It is clear from the table that the value of Coxen calculated (1) is less than the tabular value (8) at the level of significance (0.05) and degree of freedom, and this indicates that there are statistically significant differences at the level of (0.05) in the fluency of the experimental group in the pre- and post-tests, and thus the zero hypothesis is rejected.

The researcher attributes this to the use of the Project-based learning strategy with the two experimental groups in terms of interest in teaching the topics of the lesson

The table shows the arithmetic mean and standard deviation in the level of flexibility of the members of the two groups

group	Testing	Num ber		standa rd	Tot al		Wolcoxon Value	Significa nce
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			arithm etic mean	deviati on	ran ks	Avera ge ranks	Calcula ted	tabul ar	
Experime ntal group	Pre- assessm ent	10	2,10	994	4	2	4	8	Significa nt
	Post- assessm ent		06/10	3,107	51	6, 38			

Findings on the third hypothesis

"There are no statistically significant differences at the level of (0.05) in (originality) of the experimental group in the pre- and post-tests .

The researcher applied the Loksen test to detect the significant difference between the average group in the level of originality, and for the purpose of verifying this hypothesis, the results were included in the table .

It is clear from the table that the value of Coxen calculated (4) is less than the tabular value (8) at the level of significance (0.05) and degree of freedom, and this indicates that there are statistically significant differences at the level of (0.05) in the flexibility of the experimental group in the pre- and post-tests, and thus the zero hypothesis is rejected.

The researcher attributes this to the use of the Project-based learning strategy with the two experimental groups in terms of interest in teaching the topics of the lesson

The table shows the arithmetic average and the standard deviation in the level of originality of the members of the two groups

group	Testing	Num ber	arithm etic mean	standa rd deviati on	Tot al ran ks	FS-3 Avera ge level	Wolcoxon Value		Significa nce
							Calcula ted	tabul ar	
Experime ntal group	Pre- assessm ent	10	36-50	5,986	6	2	6	8	Significa nt
	Post- assessm ent		69,60	54,914	49	7			

Results related to the fourth hypothesis

"There are no statistically significant differences at the level of (0.05) in (creative thinking) of the experimental group in the pre- and post-tests .

The researcher applied the Loksen test to reveal the significant difference between the average group in the level of creative thinking, and for the purpose of verifying this hypothesis, the results were included in the table .

It is clear from Table () that the value of Wilcoxon calculated (6) is less than the tabular value (8) at the level of significance (0.05) and degree of freedom, and this indicates that there are statistically significant differences at the level of (0.05) in the originality of the experimental group in the pre- and post-tests, and thus the zero hypothesis is rejected.

The researcher attributes this to the use of the Project-based learning strategy with the two experimental groups in terms of interest in teaching the topics of the lesson

The mathematical average table and the standard deviation in the level of creative thinking of the members of the two groups

group	Testing	Num ber	arithm etic mean	standa rd deviati on	Tot al ran ks	FS-3 Avera ge level	Wolcoxon Value		Significa nce
							Calcula ted	tabul ar	
Experime ntal group	Pre- assessm ent	10	53/70	7,379	0	55	0	8	Significa nt
	Post- assessm ent		107,10	27,695	0	55			

two experimental groups in terms of interest in teaching the topics of the lesson .

Measuring the size of the effect : The size of the effect has been extracted as follows:

1- The mean and standard deviation of the pre and post tests and the weighted standard deviation of the fluency variable of the experimental group were extracted as shown in the table

It is clear from Table (0) that the calculated value of Wilcoxon is less than the tabular value (8) at the level of significance (0.05) and degree of freedom, and this indicates that there are statistically significant differences at the level of (0.05) in the creative thinking of the experimental group in the pre- and post-tests, thus rejecting the zero hypothesis.

The researcher attributes this to the use of the Project-based learning strategy with the

Average arithmetic table and standard deviation of the fluency variable for the pre- and post-tests

The test.	T value	Correlation coefficient between the two tests	Effect Size	Blur effect
Before	7,673	228	3,015	High
After				

2. The arithmetic mean and standard deviation of the pre- and post-tests and the weighted standard deviation of the elasticity variable of the experimental population are derived as shown in the table below:

After applying the Cohen equation, the size of the effect was (3,015). Therefore, the size of the effect of the Project-based learning strategy in the development of creative thinking (fluency) is considered to have a high effect for the experimental group.

Table of mean and standard deviation of the flexibility variable for the pre- and post-tests

The test.	T value	Correlation coefficient between the two tests	Effect Size	Blur effect

Before	3,956	0.168	1,613	High
After				

3- The arithmetic mean and standard deviation of the pre- and post-tests and the weighted standard deviation of the originality variable of the experimental group were extracted as shown in the table

After applying the Cohen equation, the size of the effect was (3,015). Therefore, the size of the effect of the Project-based learning strategy in the development of creative thinking (flexibility) is considered to have a high effect for the experimental group.

Table of mean and standard deviation of the originality variable for the pre- and post-tests

The test.	T value	Correlation coefficient between the two tests	Effect Size	Blur effect
Before	4,020	172	1,635	High
After				

4- The mean and standard deviation of the pre- and post-tests and the weighted standard deviation of the creative thinking variable of the experimental group were extracted as shown in a table.

After applying the Cohen equation, the size of the effect was (3,015). Therefore, the size of the effect of the Project-based learning strategy in the development of creative thinking (originality) has a high effect for the experimental group.

Table of mean and standard deviation of the creative variable for the pre- and post-tests

The test.	T value	Correlation coefficient between the two tests	Effect Size	Blur effect
Before	5,609	208	2,232	High
After				

After applying the Cohen equation, the size of the effect was (3,015). Therefore, the size of the effect of the Project-based learning strategy in the development of creative thinking has a high effect for the experimental group.

Third : Conclusions: In light of these results, the researcher came up with a number of conclusions, including :

1. The Project-based learning strategy has a great role in improving and

developing creative thinking among the students of the Institute of Fine Arts in the subject of interior design, not only for the distinguished, but also took care of the rest of the students as well.

2. The Project-based learning strategy formed a significant effect on the development of creative thinking among the students of the Institute of Fine Arts in the subject of interior design.

3. The scale of creative thinking in the dimension indicated a remarkable development from the first reading in the creative thinking of interior design.
4. There is a very high difference between the pre and post responses on the scale of creative thinking for the students of the Institute of Fine Arts in interior design.

Fourth : Recommendations : Based on the above, the researcher recommends in the light of the results of the research and its conclusions, which reached a number of recommendations, including :

2. The need for beautiful arts institutes to promote creative thinking and its standards among students of the institute in all technical and skill courses .
3. Adopting the Project-based learning strategy in teaching the subject of interior design to fifth graders at the Institute of Fine Arts because of the success of the experiment with the research sample.

Fifth: Proposals: In light of the previous results, the researcher proposes the following:

1. The effect of the Project-based learning strategy in developing the skills of the students of the Art Education Department with the subject of sculpture .

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